

Implementing Service and Support Management Processes: A Practical Guide

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Title: Implementing Service and Support Management Processes: A Practical Guide

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Editors: Carrie Higday-Kalmanowitz and E. Sandra Simpson

Authors and Subject Matter Experts: Pat Albright
Mark Bradley
Chris Broome
David Chiu
Paula 'Tess' DePalma
Michael Devaney
Troy DuMoulin
Mark Ellis
Malcolm Fry
Jayne Groll
Brian Johnson
Char LaBounty
Vernon Lloyd
Ron Muns
Greg Oxton
Peter Pace
Glen Purdy
David Pultorak
Julie Quackenbush
Michelle Ross-McMillan
Faye Rukstales
Aale Roos
Cheryl Simpson
Pam Suekawa-Reynolds
Dr Frederick Van Bennekom

Quality Review Team: Pat Albright, Brenda Iniguez, Scott Koon, Robert Last,
Eppo Lupes, Dick Szymanski and Phil Verghis.

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Preface

Ron Muns, CEO and founder of HDI

HDI, the world's largest association of IT Service and Support professionals, is pleased to bring you the first comprehensive process guide for IT or technical Support Center organizations serving internal 'end-users' and/or external customers. It is based upon ITIL®, but it takes the ITIL framework to a more practical level in order to assist you implement best practices specifically geared to a Support Center environment. This is the process guidance you have been waiting for! In addition to the ITIL processes covered in the *Service Support* and *Service Delivery* books, we have included several additional processes of importance to support organizations as well as a Balanced Scorecard Service Model developed by HDI.

HDI's scope and focus evolve as our member organizations change. We are no longer the Help Desk Institute, but merely HDI. Our focus recognizes the enlargement of the role and increasing professionalism of IT and the Support Organization. According to the HDI 2004 Practices Survey, 39% of all Support Organizations refer to themselves as 'Help Desk' although many other names and titles exist. The term 'IT Support Organization (or Center)' is used in this book as a generic reference to the IT Organization that represents the first point of contact for end-users (customers) (internal and external) customers. Such contact comes from phone calls, email, self help, self diagnostic tools, fax, and more. These role of the typical support organizations generally include second level support, desk side support, incident management, and involvement in most ITIL defined processes. The typical HDI member IT Support Organization performs all of the activities defined by ITIL within the "help desk," service desk, and more.

Support organization processes can be developed from the guidance presented in this book. While this book focuses on the IT Support Organization, it is vital to realize that all of IT must use common terminology and integrated processes. IT must play as an integrated team. IT must support the overall organization's strategies in a business-like fashion. This can only happen if IT is 100% committed to using common terminology and integrated practices. For IT to be a team, everyone must learn recognized IT organizational processes and the many individual and team roles within IT.

HDI has long been recognized for our conferences, open industry certification standards for individuals and Support Organizations, training curriculum, member deliverables, and opportunities for networking with peers. Now, you have asked for guidance on processes. This book is our answer to your request. If your IT organization is going to implement ITIL, you'll find this book to be extremely helpful. If your entire IT organization has not embraced ITIL, it will still provide you with important guidance for process improvement. It is not enough to know which processes need to be in place - you need to know *how* to implement, optimize and maintain those processes in your own organization. This book provides prescriptive guidance for any IT Support Organization to use - regardless of size, and whether or not internal or external customers are served. Although this book was written with Support Center

managers, directors, and VPs in mind, anyone interested in best practices for the Support Organization will find this book invaluable in planning and in daily operations.

Everyone involved with the creation of this book - authors, subject matter experts, quality reviewers and the development team - is at the top of their field and extremely respected within the support industry. In addition, you'll recognize many names as ITIL experts. HDI's goal was to bring together the best of the best in ITIL and in the IT service and support industry, and we're confident that we've met our objectives.

Special thanks to all the volunteers responsible for this book - HDI appreciates all the valuable time and knowledge you have donated to make this book possible. Your passion for the industry is humbling.

Please feel free to forward me any comments you may have about this book to support@thinkhdi.com. Your feedback will be helpful to HDI in future versions of this book.

Ron Muns

Introduction

By E. Sandra Simpson

This book is the result of many discussions with a wide variety of Support Center practitioners and experts who wanted to have a process guidebook that was directed specifically at the Support Center (supporting internal ‘end-user’ employees or external customers). HDI assembled a content scope team, representing both Support Center practitioners and ITIL experts, to develop the following objectives for this book:

- to provide a holistic view for setting up a Support Center and to provide a reference for Support Managers as they evolve their existing Support Center
- to provide a practical approach, including prescriptive guidance, to implementing ITIL processes and other Support Center processes not in ITIL
- to provide a focus on operational metrics for the Support Center.

The intent of this book was not to rewrite existing information in the public domain (such as the ITIL Service Support and Service Delivery books) but to provide a practical guidebook that is focused specifically on the Support Center - not the entire IT Service Management domain.

The HDI Support Center Process Guidebook is relevant to anyone involved in a Support Center environment. All levels of management for both internal and external Support Centers can use this practical guide to implement, manage and optimize all relevant Support Center processes. Business managers will find the book helpful in understanding and establishing best practice Support Center services.

Each chapter of this book was written by a different author and reviewed by a number of subject matter experts (SMEs). While this approach has provided the best perspectives in the industry, each chapter is written in a slightly different style. As a result, readers may see differences in the use of terminology. We have attempted to normalize the language, but it is not an easy task, so please forgive us where we fail. A minor example relates to an age old argument over who is served: customers, users, or end-users? The ITIL preferred term is end-user for the individuals who contact the support organization for support or service. The ITIL preferred definition for the individual who leads the organizational units in which the end-user works is customer. In ITIL terminology the customer is the person who negotiates service levels and to whom the Support Center (Service Desk) report performance. You will find some inconsistency in the use of these terms, but we do not believe this will diminish the value of the book.

The term ‘Support Center’ goes by many names in different organizations, but no two organizations are exactly alike. While we are trying to promote the ITIL terminology for processes, we see an issue with the ITIL use of the terms Help Desk and Service Desk. ITIL has specific definitions for Help Desk and Service Desk, which often do not align with many real world Support Centers. This can cause confusion and misunderstanding.

Footnote:

In 2004, HDI changed its name from Help Desk Institute to HDI, largely because of the confusion created by the limited role that the UK Office of Government Commerce (OGC) has given to the term. Our membership has always had a much broader role and has always had primary or secondary responsibility for most ITIL processes. HDI is the leading association for IT Service and Support professionals and the function above for the Support Center represent the primary roles and responsibilities of our member organizations.

Authors and Subject Matter Experts

An international range of Support Center practitioner authors and subject matter experts provided guidance in this book. The material was developed and written by:

Pat Albright	IT Support Consultants, Inc.
Mark Bradley	JP Morgan Chase
Chris Broome	The Diagonal Group
David Chiu	BMO Financial Group
Mike Devaney	Independent Consultant
Paula ‘Tess’ DePalma	Nemours
Troy DuMoulin	Pink Elephant Inc.
Mark Ellis	Kronos Inc.
Malcolm Frye	Executive Remedy Partner
Jayne Groll	ITSM Academy, Inc.
Brian Johnson	Computer Associates
Char LaBounty	Char LaBounty & Associates
Vernon Lloyd	FoxIT
Greg Oxtan	Consortium for Service Innovation
Peter Pace	United Airlines
David Pultorak	Fox IT
Glen Purdy	Fujitsu Consulting
Julie Quackenbush	Nationwide
Aale Roos	Quint Wellington Redwood Oy
Michelle Ross-McMillan	Nationwide
Faye Rukstales	BMC
Cheryl Simpson	BMO Financial Group
Pam Suekawa-Reynolds	Remedy Corporation
Dr. Frederick Van Bennekom	Great Brook Consulting

Quality Review Team

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Thank you also to following people who shared quality review comments for specific sections of the book: Scott Koon, Robert Last, Eppo Lupes, Dick Szymanski and Phil Verghis.

Content Scope Team

HDI would also like to thank those people whose guidance on the Content Scope team for this book helped ensure that this book would be relevant to its target audience. The Content Scope team was comprised of the following individuals:

Judy Benda	PCHowTo, Inc.
Malcolm Fry	Remedy Executive Partner
Carrie Higday-Kalmanowitz	HDI
Brian Johnson	Computer Associates

Scott Koon	Mayo Clinic
Dawn Mular	Sun Microsystems
Ron Muns	HDI
David Pultorak	Fox IT
Marta Scolaro	Johnson Diversey
E. Sandra Simpson	SITA INC

The content of this book was coordinated and managed by Carrie Higday-Kalmanowitz and E. Sandra Simpson.

The Best Practice Framework for the Support Center Guide

The IT Infrastructure Library (ITIL)

ITIL is the most widely accepted approach to IT service management in the world. ITIL provides a comprehensive and consistent set of best practices for IT service management, promoting a quality approach to achieving business effectiveness and efficiency in the use of information systems. (Introduction, ITIL Service Support, Office of Government Commerce, 2000)

HDI Support for ITIL

HDI supports the best practice guidance found within ITIL as it applies to the processes within the Support Center and IT at large.

HDI Support for other Support Center Processes

HDI recognizes that alongside the relevant processes found in ITIL, there are several other processes that are also relevant to the Support Center. These have been included as part of the disciplines covered in this book.

Key processes for the Support Center

They key Support Center processes identified for discussion in this book include several ITIL processes, as well as other processes determined to be important for relevant for Support Center best practices:

- Base structure processes for the Support Center
- Financial/Operational Management

Shared ITIL /Support Center processes

- Financial Management
- Configuration Management
- Change Management
- Release Management
- Incident Management
- Problem Management
- Service Level Management
- Capacity Management
- Availability Management
- IT Service Continuity Management

Additional Support Center processes

- Operational Management
- Knowledge Management
- Workforce Management
- Customer Satisfaction Measurement

Processes defined

Financial/Operational Management

Financial Management for the Support Center is a subset of Financial Management for IT as defined by ITIL. Operational Management focuses on the Support Center's Balanced Scorecard of Customer Satisfaction Goals, Employee Satisfaction Goals, Costs/Productivity Goals and Organizational Maturity.

Knowledge Management

Knowledge Management is not currently recognized as an ITIL process. Knowledge Management in the Support Center refers to the practice of managing, building, and re-using information in context.

Configuration Management

Configuration Management is the process that enables the Support Center to quickly isolate, diagnose, and restore service by ensuring up-to-date information about supported components of the IT infrastructure.

Change Management

The Change Management process manages all changes that affect services provided by the Support Center.

Release Management

Release Management manages the release of all approved changes.

Incident Management

Incident Management is the process that manages incidents that are reported to the Support Center and focuses on returning the user to an operational state as quickly as possible.

Problem Management

Problem Management manages the process of determining and removing problems that are the underlying causes of incidents that are reported to the Support Center.

Service Level Management

Service Level Management is the process used to form agreements with customers for Support Center services as well as negotiate operational agreements and underpinning contracts with suppliers to the Support Center to support customer agreements.

Capacity Management

Capacity Management ensures that the IT infrastructure has the capacity to provide the

services required to support the business, to ensure that service availability and agreed service levels can be obtained.

Workforce Management

Workforce Management ensures that there are enough support center staff available to support the required capacity.

Availability Management

Availability Management ensures that the services provided by the Support Center are available when requested by customers and to the level previously agreed via Service Level Management.

IT Service Continuity Management

IT Service Continuity Management ensures that the probability of a disruption in service is reduced and in the event of a potential or actual degradation of service availability that steps are taken to ensure service continuity to customers.

Customer Satisfaction Measurement

Customer Satisfaction Measurement processes ensure that customers are satisfied with the services and level of service provided to them and assists in identifying areas for improvement.

Getting started with process implementation

Some support organizations may be in a position to implement all processes, while other organizations may be implementing processes in stages. Whatever the situation, consider the following when developing project plans.

Management commitment

No process improvement initiative can be successful without Senior Management commitment. Some process improvement progress can be made at the line management level working in isolation without executive support. However, to be truly successful Support Center process improvement initiatives need full senior management support. In addition, a corporate or organizational culture that supports process change also needs to be in place if you expect all practitioners and stakeholders in the process to adapt and use the process in a consistent way.

End-user (customer) and service provider support for process change

To ensure process improvement success it is also important to market the need and benefits of process change to both end-users and service providers of the process. Where applicable, the implementation of Service Level Management can assist with obtaining agreement on the services that will be provided by the support organization, together with the required underpinning contracts and operational agreements necessary to deliver these to Support Center customers and end users.

Understanding of process change as a team activity

Support Center processes are interrelated to all of IT. Everyone in IT must buy in and support common terminology and process. It will be important for the entire organization to support process change and related continuous improvement activities. The Support Center can accomplish some process improvement as an “island” but real change will only occur when

you consider process improvement to be a team activity that includes all of IT.

Recommended reading and education

Readers of this book are also urged to read the official ITIL process books:

- Service Support, Office of Government Commerce, 2000, ISBN 0 11 330015 8
- Service Delivery, Office of Government Commerce, 2001, ISBN 0 11 330017 4

ITIL Certification is also strongly recommended for those who wish to implement the ITIL related processes.

Other recommended reading:

- Service and Support Handbook, HDI
- Running an Effective Help Desk, Barbara Czegel, 1998, ISBN 0 471 24816 9

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Chapter 1:

Financial and Operational Management

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1.1 Overview

1.1.1 Description

Effective financial and operational management of a Support Center focuses on costs, customer satisfaction, employee satisfaction and organizational maturity. When integrated in a Balanced Scorecard Service Model, these four elements form a high-level goal set with supporting key performance indicators (KPIs), also known as key business indicators or operational metrics. This is a powerful model that enables the Support Center Manager to look at past performance and trends, together with optimized forecasting of future costs, operational performance and service levels based on workload for the projected base of customers, whether internal or external. This process will even allow for almost total automation of future budgets down to the line item level.

The model will also provide a basis for effective measurement of return on investment (ROI) for new productivity technologies, workflow redesigns, outsourcing or business process re-engineering within the Support Center.

This chapter does not review basic budgeting and accounting concepts. The approaches presented in this chapter support the ITIL Financial Management framework; however, they go beyond ITIL to address the specifics of the internal and/or external Support Center environment. The chapter provides guidelines for both financial and operational management of the Support Center.

1.1.2 Metrics - using the Balanced Scorecard Service Model

The goal of the Balanced Scorecard Service Model for the Support Center is to balance service goals and supporting key metrics that may at times conflict with one another. For example, if you are 100% committed to customer satisfaction, your costs may get out of line or your employee morale may suffer. The framework, outlined in Figure 1.1, identifies the key categories for measuring the success of support.

What is a Balanced Scorecard?

A new approach to strategic management was developed in the early 1990s by Drs. Robert Kaplan (Harvard Business School) and David Norton. They named this system the 'Balanced Scorecard'. Recognizing some of the weaknesses and vagueness of previous management approaches, the Balanced Scorecard approach provides a clear prescription as to what organizations should measure in order to 'balance' the financial perspective.

The Balanced Scorecard is a management system (not only a measurement system) that enables organizations to clarify their vision and strategy and translate them into action. It provides feedback around both the internal business processes and external outcomes in order to continuously improve strategic performance and results. When fully deployed, the Balanced Scorecard transforms strategic planning from an academic exercise into the nerve center of an enterprise. *Source: The Balanced Scorecard Institute*

Customer Satisfaction Goals Supporting KPIs	Employee Satisfaction Goals Supporting KPIs
Costs/Productivity Goals Supporting KPIs	Organizational Maturity Goals Supporting KPIs

Figure 1.1 The Support Center Balanced Scorecard Service Model

The key to a successful Support Center Balanced Scorecard Service Model is to maintain continued balanced improvement in all four quadrants over time.

Customer Satisfaction Goals

Customer satisfaction is generally measured via customer surveys. To minimize bias, an external firm should ideally conduct these surveys. External survey firms may also offer comparative industry data or provide additional analytics on survey results.

The primary customer satisfaction survey is transaction based, which involves using an abbreviated set of questions based on closed incidents (phone, email or Web). These surveys are usually focused on a limited number of questions specific to an incident during a given period, and specifically target the person who generated the original incident. Standard sample questions might include:

- Please rate the accuracy of the solution provided.
- Please rate the timeliness of the solution provided.
- Please rate our initial responsiveness to your incident.
- Please rate the professionalism of the Support Engineer who answered your incident.
- Please rate your overall experience for this incident.

These questions may be rated on a numeric scale (e.g. 1 to 5) or a simple word scale (e.g. positive, neutral or negative). Most Support Centers using a transactional type survey will monitor this process to ensure they do not over survey the same customers (e.g. not surveying the same customer more than once every six months).

The second type of survey is a loyalty survey, which is usually targeted at the decision-maker for external facing customer Support Centers. This survey is generally written (hardcopy or online) and is focused on the customer decision-maker's perception of the value of the service received. These surveys generally target the broader customer base, whether or not they used the Support Center's services during the period being measured. Most Support Centers do not want to undertake this type of survey more than once a year per customer. These surveys are generally more detailed and designed to reveal specific perceptions that decision makers may have about your services to their operations.

A Support Center's overall customer satisfaction rating may be based on both types of surveys for a given period. The formula used should be biased towards the transactional survey, as this is a true measure of the operation's current level of customer satisfaction. For example, overall customer satisfaction scoring may be based on 70% transactional and 30% loyalty. Using a 5-point scale for both in this example, with 1 being low, if the average transaction survey score was 4.4 and the average loyalty survey was 3.9, then the overall customer satisfaction score for this period would be 4.25 $[(.70 * 4.4) + (.30 * 3.9)]$.

While the overall survey scores are important for both types of surveys, the true value is found in the individual response verbatim from each survey. Priorities can be established by assimilating the verbatim feedback into specific categories, based on the type of feedback received. Support Center Managers can easily identify which issues they need to address first, as well as which areas need less attention at a given point in time.

Overall customer satisfaction is one of the primary drivers in contract renewal rates for externally facing Support Centers. This has a direct impact on contract revenue streams, which in turn drive the funding levels for most Support Centers. Internal Support Center operations are also being challenged more and more for generic application support (i.e. general off-the-shelf applications) as more and more functional segments of organizations look to lower internal chargeback costs and improve service levels through outsourcers both on and off shore.

Further information regarding the customer satisfaction process can be found in the Customer Satisfaction Measurement chapter in this book.

Employee Satisfaction Goals

In any service business, the people who deliver that service are the essential product. Despite this, many service organizations, including both internal and external Support Centers, do not properly manage and maintain their employees' general job satisfaction. This can affect customer satisfaction as well as the cost of operations.

The average time to fully train a new employee in customer support ranges from a few months to a year or more, depending on the complexity of the services and/or products supported. This does not include 'fill time' - the time from the when a replacement requisition is cut until the position is filled. Over the last ten years, fill time has averaged about 60 days. The 'fill rate' average, however, can spike significantly when labor markets get tight.

Worse still, most customer support organizations fail to capture the knowledge of people leaving the organization. Yet there are systems that can effectively do this, beyond the traditional knowledge base systems. In most cases, this knowledge of an organization's products and customers is lost when these employees leave. While some level of turnover can be healthy for an organization, excessive turnover can have a significant negative impact on the operation. It is important to remember that labor costs are generally between 60% and 70% of the total cost of any customer support operation.

Most effective employee satisfaction survey processes go beyond just asking questions. Verbatim feedback from employees should be given significant attention. By categorizing this feedback (especially for low scoring areas that have a high importance quotient) issues requiring immediate attention can be identified. A cross-section of the operation should evaluate and determine what action needs to be taken to address high priority issues. This cross-section should include rank and file support engineers, management and staff personnel. Some organizations also include a representative from HR on this team. As with the customer survey, this process should be geared toward taking action and not just generating a periodic 'number.'

An employee survey should be conducted twice a year with each employee, ideally about six months apart. Regular surveys will allow comparison of results and will identify improvement and/or dissatisfaction over time.

Finally, organizations that manage employee satisfaction effectively do not always have the highest pay scales for their area. Pay rates are often ranked as the third or fourth most important issue on employee surveys. Generally, communication and training will be more of an issue. Well-managed Customer Support Centers that can integrate employee needs into an effective service delivery model will become a target employer of future employees.

Costs/Productivity Goals

It is time for the industry to come together and agree on definitions and methods for developing cost metrics; this is the only way that benchmark comparisons can have any value. Standard costing (and operational) metrics will allow support organizations to understand their cost structures and operational efficiencies in comparison to other organizations or within the organization itself. It will help you understand and answer questions, such as:

- are we spending too little on support infrastructure and too much on labor?
- are our costs for eSupport too high?
- how much could we save by moving our end-users from phone support to self-help?
- are our costs high because we have excessive overhead allocations?
- when can we expect to get a return from the introduction of new support tools?
- we provide Level 1, Level 2 and Level 3 support and thus our cost per incident is higher than that of our competitors. Does management understand that our competitors' support costs only include Level 1 support? Or, does management understand that a competitor's support organization only provides log and route support?

At the heart of costing and costing metrics is the need to develop comparisons that include common definitions, common volumes, common costs and common methodologies. At a minimum, this needs to be done within the support organization itself for comparative purposes over time.

Financial analysis on the support organization is based on calculating costs in terms of cost per unit of work and per service delivered (e.g. per incident). The most important unit is the cost per incident, which should be computed separately by channel received (phone, self-help, chat, email, self-healing, etc.). This analysis may be further broken down by products or services offered. For high volume Customer Service Centers, such as financial institutions providing informational services (e.g. bank balances, resolving billing issues, etc.), the vast majority of their incidents are handled in one call. Their key cost indicator would probably be cost per call with the volume metric coming from the Automated Call Distributor system (ACD).

Support Centers provide their services to internal IT users or external customer-focused operations. They may provide support for software applications and/or hardware support and/or network support. These incidents are generally more complex, with a longer average call duration, and frequently will not be resolved on the first contact and/or may require follow-up to ensure closure. This type of environment should be costed out at the incident level versus the call level. One reason for this is that any service goal will drive the behavior of the organization, either directly or indirectly. It is extremely important to select goals that will drive the desired behavior of the service delivery organization. Reward systems should be based on performance against goals and not performance against supporting KPIs.

If a Support Center Manager is being measured on the group's cost per call, then the cost per call can be lowered simply by increasing the number of calls coming into the Support Center. Lowering the service level is an easy way to do this. While this strategy may well lower the cost per call, it will also lower overall customer satisfaction or employee satisfaction if this is accomplished by understaffing. It is important to remember that reward system measures for individual performance, whether managers or individual contributors, will drive behaviors in the organization. The Balanced Scorecard Service Model approach is intended to recognize the multiple priorities that we must seek to balance.

The Balanced Scorecard Service Model design must select the right goals; it must also link these goals to ensure that the operation maintains a balanced performance as part of a continuous improvement process. In the cost per unit of work example, it does little good to continually reduce the cost per incident (regardless of how it is accomplished) if the customer satisfaction rating and/or employee satisfaction rating also continues to decline.

Other cost per unit measures could also include cost per user for internally-facing Support Centers and cost per contract for externally-facing Support Centers. Both of these may be further broken down by product or services offered. Generally, better results are achieved using basic measures that can easily be understood by all levels of the organization. The average cost per user calculation would be calculated by dividing total cost for the period by the average number of users supported for the same period. Similarly, in calculating the average cost per contract, divide total costs by the average number of contracts for the same period. Calculating total costs, as well as average contracts and average number of users supported, will be discussed later in this chapter.

Organizational Maturity Goals

Of the four quadrants, Organizational Maturity is the most strategic and subjective. It is focused on the organizational structure, ability to change, quickness, responsiveness and strategic positioning of support within the larger organization. Organizational maturity enables customer and employee satisfaction with optimal cost structure. Elements to track that indicate organizational maturity include:

- visible executive support of the Support Center
- time to fill knowledge gaps - when new errors are identified, how long does it take to document the problem and the solution? How long does it take for this information to be available to the support analysts and end users (customers)?
- time to employee proficiency - how long does it take for new employees to be productive?
- time to new product proficiency - how long does it take for the support organization to be proficient on new products?
- flexibility of cost to changes in workload - how quickly can the support organization change the cost structure (up or down) as work varies?
- diversity - has the organization embraced the values of racial and cultural diversity within support? If the organization has global team members, are they aware of cultural and local issues that vary the definition of best practice?
- work elimination through problem management and change management - tracking of cost savings resulting from identification and elimination known errors
- formalization of IT processes - tracking indicators that the support organization has integrated all support processes with those of other IT functional areas

Over time most forward thinking organizations will continue to evolve, driven by competition, new products or services, new service delivery technologies or continuous improvement in process or workflow design. All world class organizations are constantly challenging themselves to find ways to continuously improve their operational efficiency through organizational optimization. For example, moving toward a generalist Level 1 environment allows for an expanded career development for the analyst; it also enables increased flexibility for the organization and more effective resource management. Product or service specialization will generally begin at Level 2 and above.

Other concepts might include 'Follow the Sun' or 'Virtual Support'. The support organization could be dispersed, operating from anywhere to anywhere in the world, using a common connected technology infrastructure (with supporting processes and workflows) and servicing customers at any time.

More mature organizations may also be capable of assisted 'self-assessment' as well as 'self direction'. Organizational and operational goal sets will need to be clearly defined and balanced by the proper level of organizational oversight to ensure that operational goals are met and the overall health of that segment of the operation continues to be maintained or improved over time.

1.1.3 Costing methodology structure

Figure 1.2 below shows the major categories of costs to consider. You could consider these as high level cost groupings. Each organization will have different departments, organizational structure and accounts. Regardless of your organizational structure, you should be able to convert your costs to the following general structure. The objective of the major and minor costing structures is to provide a framework that will allow support organizations to do benchmark cost comparisons. Following the chart is a list of the minor costing elements within each category.

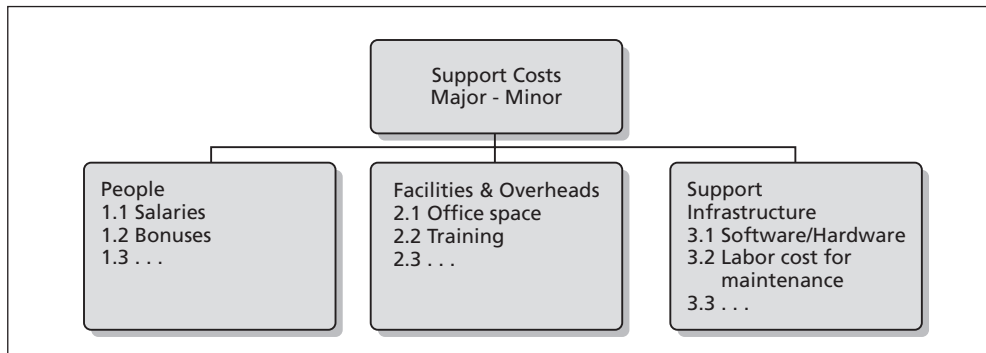


Figure 1.2 Major and minor support costing structure

People - direct labor for support personnel to include: (generally 60% to 70% of total operational costs)

- Salaries
- Bonuses
- Vacations/Benefits
- Estimated increases
- Overtime
- Contractors

Overhead allocations and facilities (percentages will vary from organization to organization)

- Office space (lease or depreciation), parking, common areas, backup facilities, and maintenance
- Training, travel and entertainment, and recruitment
- Common technology charges (lease, depreciation, maintenance) for telephones, PBX, general desktop software (not support specific), and network connectivity.
- Business Continuity/Disaster Recovery (standby facility charges)
- Professional fees/services that are general in nature
- Voice and data monthly fees/allocations

Support infrastructure (percentages will vary from organization to organization)

- Software and hardware leases, licenses and maintenance costs for tools unique to the support organization. These include (but are not limited to) ticketing systems, knowledge systems, ACD systems, chat, monitoring/remote control tools, self healing/self help tools, workforce planning/labor management, asset management, software distribution, password reset, computer telephony integration and special reporting and analysis systems.
- Labor cost for maintaining the support infrastructure
- Depreciation (hardware and applications)

The major categories of costs are also useful for comparisons. If an organization proportionally has a high per person cost and their overall cost per incidents is high, then they may not be spending enough on support technologies or it may have poorly designed workflows, processes or service delivery organizational structures. If an organization has high overhead allocations, this might explain why their cost metrics are higher than those of their peers. These metrics are useful when looked at in relationship to others or trended over time within the organization itself.

Each of the costing categories/elements should be allocated to the activities performed by the support organization. Some of the costs will be allocated based upon:

- headcounts - preferably either total headcount or more ideally Fulltime Technical Equivalents (FTEs); alternatively, total headcount
- time allocations (where staff members perform multiple activities)
- volume of work
- allocations for certain cost specific to the type of work performed, for example, cost for chat software would be allocated to cost per incident handled via chat.

Some of the costs may need further analysis and grouping before being allocated to the activities performed by the support organization, such as costs for maintaining the call ticketing system.

The key to costing is to identify what drives the cost. This method of costing is often referred to as Activity Based Costing or ABC costing.

Missing and misallocated costs

To determine the total costs of a Support Center operation, the Support Center Manager should identify the total costs as if the Support Center were a stand-alone, independent operation. When you review the items to include in each costing activity, you may determine that certain support costs are incurred in other departments. For comparisons you must add these costs to your calculations. Similarly you may have reported on costs in the Support Center's budget that apply wholly or partially to other functions. These should be removed before you begin the allocation process.

Service organizations perform many discrete activities. Each of these activities is part of the workflow process that determines the organization's outcomes. These activities may be associated with one cost metric or several. For example, the total cost per incident will include call activities, eSupport activities, Level 2/3 and more. People often perform multiple tasks, so

their costs must be allocated based on the time they spend on various activities. For example, some individuals will spend part of the day handling incidents reported via the phone and other portions of their time will be spent responding to email or chat sessions.

Every organization is different and the methods by which they deliver support will vary. There will be ‘company-unique’ activities within support. While company-unique activities are not comparable, these activity costs can be identified and the drivers or measures can be identified to allow you to allocate these costs to standard costing metrics.

Cost allocation for support activities

Below is an example of some of the support organization activities that you may have. Once you know the total costs and the measures to use for allocation purposes, you will be able to begin the allocation process. Support activities for which you will need to determine costs will include:

- call handling
- email response
- supporting infrastructure tools
- knowledge building and maintenance
- escalation management
- Problem Management
- incident research

Level 2/3 staff support -it is impossible to obtain relevant comparisons for Level 2 versus Level 3, so these costs are grouped together:

- desk side support
- specific product(s) supported or incremental service (e.g. remote installations, remote upgrades, remote consulting, etc.)

1.1.4 Allocation from costing elements to activities

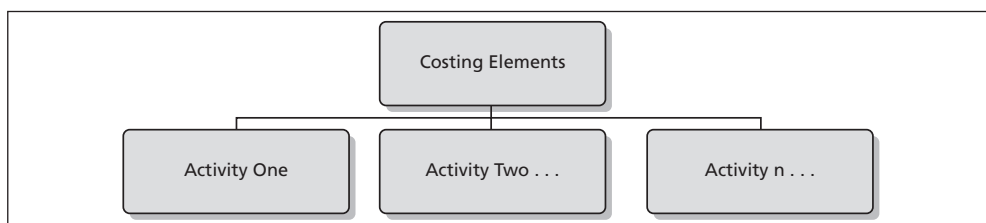


Figure 1.3 Allocation from costing elements to activities

‘Activity Based Costing’ or the ABC Method allows you to take costs from financial cost categories/elements and group them into the activities performed within the support organization. Once you have allocated all cost elements to the activities within the Support Center, you are ready to summarize cost into cost units. These units (metrics) are the units of measure that you will use to track how you are doing over time or for comparison to peers.

Costing performance metrics

Phone metrics:

- cost per incident - total cost for support incidents received by phone divided by the number of incidents resolved via the phone.
- Level 1 Resolution Rate - total incidents received by phone and resolved by Level 1, divided by total incidents handled by Level 1.
- Level 1 Escalated Rate - total incidents escalated by Level 1 to Level 2/3 divided by total incidents handled by Level 1.
- Level 2/3 Support Resolution Rate - total incidents resolved by Level 2/3 divided by total incidents handled by Level 2/3.
- cost per call - this is the total cost for handling end user (customer) calls regardless of the reason for the call to include call to report new incidents or from an end-user (customer) to check on the status of an open incident.
- first call resolution rate - the percent of all phone incidents that are solved on the first call. This could include the Level 1 analyst involving others in the resolution process.
- percent of total support staff handling incidents reported by phone
- average speed of answer (also referred to as ASA)
- average talk time
- dispatch/routing - cost per incident received by phone that is logged and routed with little or no attempt to resolve.

Self-help metrics:

- cost per self-help incident - this is the total cost of building and maintaining self-help technologies and knowledge divided by the number of incidents resolved by the end user (customer) using self-help technologies.
- self-help resolution rate - this is the percentage of end users (customers) that resolve their incident on their own divided by the total number that attempt before they exit the self-help system.

Self-healing metrics:

- cost per incident diagnosed - total costs (people, support infrastructure, and overhead) associated with building, deployment, and support of self-diagnostic tools divided by the number of incidents diagnosed.
- cost per incident healed - total costs (people, support infrastructure, and overhead) associated with building, deployment, and support of self-healing tools divided by the number of incidents that are resolved (healed) without the need for human intervention plus the cost per incident diagnosed. Cost for diagnostics and healing can be difficult to separate. As all incidents healed were also diagnosed, the diagnostic costs must be included as well.

Email metrics:

- cost per incident reported via email - this is the total cost of the Level 1 support staff for handling email divided by the total number of incidents reported via email. This will include all communications to/from the end user (customer) as well as communications to/from Level 2/3 support staff.
- email first contact resolution rate - the percentage of all email incidents reported that are resolved in one response.

Remote control or co-browsing metrics:

- cost per remote control session - total cost for the remote control or co-browsing activity divided by the number of sessions.
- remote control resolution rate - the percentage of all remote control sessions that end in the customer's incident being resolved.

Chat metrics:

- cost per incident reported via chat - the total cost for the chat service divided by the number of incidents reported via chat.
- chat session resolution rate - the percent of all chat sessions that end in the end user (customer) incident being resolved.

Employee metrics:

- cost per FTE - when calculating the fully loaded costs per FTE, the total costs (including all overhead costs) are divided by the number of FTEs. FTEs are direct labor headcounts, annualized, that deliver services directly to customers. The more indirect or supporting headcount in the operation, the higher the costs per FTE. The ideal ratio of direct to total headcount (of the Support Center) should be between 88% and 92% of direct headcount.
- utilization rate - a utilization rate enables the Support Center Manager to calculate how many full time employees (FTEs) are needed to staff the operation. Generally, an acid utilization rate is used to determine FTE counts. An acid utilization rate looks at total direct hours divided by hours paid for the same period, without backing out the hours paid for all non-available time (e.g. vacation, sick time, holiday, training, meetings, etc.). Experience shows an industry average of between 55% and 60%. Refer to the Capacity and Workforce Planning chapter for further information.
- other metrics: from time to time additional channels are identified in which incidents are reported where peer comparisons could be useful. If you have other channels by which you receive incidents, you should track these costs and volumes separately. This will make your other metrics comparable to those of your peers in the industry. For example, you may have a walk-up desk. You should exclude these cost from the calculations above, otherwise your metrics will not be comparable to an organization without a walk-up desk.

Incident metrics (overall or summary metrics):

- cost per incident Level 1 - total costs incurred at Level 1 divided by the total number of incidents reported. This would include all channels to include your company-unique channels (e.g. walk-ups) and incidents resolved via self-diagnostic/self healing technologies.
- cost per incident Level 2/3 - total costs for support beyond Level 1 divided by the number of incidents escalated.
- Cost per incident desk side support - this is the total costs for providing desk side assistance divided by the number of desk side visits.

1.2 Implementation

An initial Balanced Scorecard Service Model can be developed very quickly, using the KPI document in the annex of this chapter. The initial model should be simple, using specific goals selected by executive management for each of the four quantifiable quadrants with KPIs for each goal selected by the Support Center management team. If you identify the major KPIs for each quadrant of the Balanced Scorecard, you will quickly be able to see the health and performance of the Support Center. A four-by-four model is quite common; it is easy to explain and will provide an effective scorecard for the organization.

Annex A1.1 provides a listing of each of the KPIs for each of Balanced Scorecard Service Model quadrants. This KPI listing includes a definition for each KPI, as well as a likely source of the information. The intent is to simplify the process by allowing Support Center Managers, with or without their staff, to develop an initial Balanced Scorecard Service Model for their operation. It should be noted that no model is truly static and it should change over time as the business changes. The important thing to remember is to maintain a documented model and to track progress over time.

Balanced Scorecards generally have high level measures for overall performance evaluations and more detailed measures for groups or individuals within the organization. We recommend that a Support Center start by utilizing a basic spreadsheet application (e.g. Excel, Lotus 123, etc.) to lay out the initial model. Figures 1.4 - 1.8 provide a simple overview of how that might look. Depending upon the audience, the metrics to be presented will change.

Key Metrics Report		Industry Average	Internal Target	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD	Q1FY98	Q2FY98	Q3FY98	Q4FY98
Customer Satisfaction		9	8.8	8.8	8.8	8.9	8.9	8.9	8.9	9	9	9	9.1	9.1	9.1	8.957967	8.8	8.9	9	9.1
Customer Sat. Rating		0	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
ASA		16.7%	16.7%	16.7%	16.7%	14.3%	14.3%	14.3%	11.4%	11.4%	8.7%	8.7%	10.0%	10.0%	12.5%	16.7%	14.3%	10.4%	9.6%	9.6%
SAs Closed/Initial Contact		80.0%	80.0%	87.2%	72.3%	68.6%	68.7%	68.8%	64.1%	65.7%	60.1%	57.9%	59.4%	52.6%	62.9%	66.8%	67.3%	63.2%	56.6%	56.6%
% SRs Reopened		2.0%	2.2%	3.4%	2.1%	3.4%	2.7%	2.9%	3.5%	2.5%	0.9%	1.5%	1.5%	1.9%	2.3%	2.6%	3.0%	2.3%	1.6%	1.6%
% SRs Escalated		12.0%	15.2%	14.1%	16.2%	13.3%	13.7%	15.8%	15.3%	14.7%	15.0%	18.4%	14.8%	19.1%	15.6%	15.2%	14.2%	15.0%	17.4%	17.4%
Average Response Time (Min)		60	62	60	50	50	50	46	46	43	43	40	40	49	61	50	45	41	41	41
Average SR Resolution Time (Min)		18	20	20	16	16	16	15	15	14	16	13	13	16	19	16	15	14	14	14
Contract Renewal Rate		92.0%	90.0%	90.0%	90.0%	95.0%	95.0%	95.0%	96.0%	96.0%	96.0%	97.0%	97.0%	97.0%	94.5%	90.0%	95.0%	96.0%	97.0%	97.0%
% Performance Against SLA		96.0%	70.0%	75.0%	80.0%	92.0%	91.0%	93.0%	92.0%	94.0%	94.0%	95.0%	96.0%	94.0%	88.8%	75.0%	92.0%	93.3%	95.0%	95.0%
Productivity																				
Total Closed SRs		1000	1000	1000	1200	1200	1200	1300	1300	1400	1400	1500	1500	1500	15000	3000	3600	4000	4400	4400
Average Cost per SR		130	\$155.00	\$155.00	\$157.00	\$132.50	\$132.50	\$128.46	\$128.46	\$120.71	\$121.43	\$113.33	\$113.33	\$130.47	\$158.33	\$132.50	\$128.75	\$115.91	\$115.91	\$115.91
Average Cost per Customer		85	\$110.71	\$108.77	\$108.44	\$104.26	\$100.95	\$96.36	\$96.81	\$94.08	\$91.35	\$87.18	\$82.93	\$79.07	\$142.77	\$331.40	\$301.26	\$262.06	\$248.78	\$248.78
Average Customers per FTE		150	140.0	142.5	147.5	138.6	143.2	150.0	143.8	147.9	142.3	150.0	134.7	143.3	143.7	143.3	143.9	144.6	143.0	143.0
Closed SRs per FTE		100.0	100.0	100.0	109.1	109.1	109.1	108.3	108.3	107.7	107.7	100.0	100.0	104.9	100.0	109.1	108.1	102.6	102.6	102.6
Acid Utilization Rate		70.0%	61.1%	70.5%	67.7%	63.9%	63.9%	61.5%	60.6%	66.3%	62.8%	60.1%	64.0%	57.7%	63.0%	66.2%	63.1%	63.1%	60.3%	60.3%
Average DL per SR (Min)		60	60.0	60.0	55.0	55.0	50.0	55.4	55.4	55.7	55.7	56.0	58.2	56.2	60.0	53.3	55.5	56.7	56.7	56.7
Average Cost per DLH		\$137.90	\$137.41	\$138.08	\$128.54	\$128.54	\$139.84	\$124.91	\$124.91	\$117.61	\$118.30	\$110.61	\$106.78	\$124.83	\$137.80	\$132.31	\$122.47	\$111.90	\$111.90	\$111.90
Employee Satisfaction																				
Employee Sat. Rating		8.9	8.8	8.8	8.8	8.9	8.9	8.9	9	9	9	9.1	9.1	9.1	8.95	8.8	8.9	9	9.1	9.1
# of Turnovers (Directs)		1	0	0	0	0	1	0	0	0	0	1	0	0	2	0	1	0	1	1
# of Turnovers (Indirects)		2	0	0	0	0	1	0	0	0	0	1	0	2	4	0	1	0	3	3
Avg Training Hours per FTE		45	45	48.7	48.9	41.7	50.0	40.8	40.8	39.8	34.3	38.0	23.6	36.3	56.79	1426	1489	1448	1316	1316
% Sch. Perf. Evalts Comp		1	100.0%	100.0%	100.0%	100.0%	100.0%	0.0%	100.0%	100.0%	100.0%	100.0%	0.0%	0.0%	76.9%	100.0%	66.7%	100.0%	33.3%	33.3%

Figure 1.4 Balanced Scorecard Service Model 1

Chapter 1

Ref. #	Category	Target	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD	Q1FY98	Q2FY98	Q3FY98	Q4FY98
Customer Sat. Metrics																			
ACD Data																			
1.2.1	Calls Received	1800	1800	1800	1800	2100	2100	2100	2200	2200	2300	2300	2500	2500	25700	5400	6300	6700	7300
1.2.2	Calls Answered	1500	1500	1500	1500	1800	1800	1800	1950	1950	2100	2100	2250	2250	22500	4500	5400	6000	6600
1.2.4	ASA	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
1.2.6	Abandon Calls	300	300	300	300	300	300	300	250	250	200	200	250	250	3200	800	900	700	700
1.2.8*	Abandon Call %	5.0%	16.7%	16.7%	16.7%	14.3%	14.3%	14.3%	11.4%	11.4%	8.7%	8.7%	10.0%	10.0%	12.5%	16.7%	14.3%	10.4%	9.6%
Call Mgt. Sys. Data																			
1.1.3*	Total Closed SRs	1000	1000	1000	1200	1200	1200	1300	1300	1400	1400	1500	1500	1500	15000	3000	3600	4000	4400
1.2.14	SRs Closed/Initial Contact	600	672	723	823	800	801	833	854	842	810	891	789	8438	1995	2424	2529	2490	
1.2.15	SRs Reopened	22	34	21	41	32	35	45	33	12	21	22	29	347	77	108	90	72	
1.2.16	SRs Escalated	52	141	162	159	104	189	199	191	210	257	222	287	2333	455	512	600	766	
1.2.17*	% SRs Closed/Initial	80.0%	60.0%	67.2%	72.3%	66.6%	66.7%	66.8%	64.1%	65.7%	60.1%	57.9%	59.4%	52.6%	62.9%	66.5%	67.3%	63.2%	56.6%
1.2.18*	% SRs Reopened	2.0%	2.2%	3.4%	2.1%	3.4%	2.7%	2.9%	3.5%	0.9%	1.5%	1.5%	1.9%	2.3%	2.6%	3.0%	2.3%	1.6%	
1.2.19*	% SRs Escalated	12.0%	15.2%	14.1%	16.2%	13.3%	13.7%	15.8%	15.3%	14.7%	15.0%	18.4%	14.8%	19.1%	15.6%	15.2%	14.2%	15.0%	17.4%
1.2.25	# Contracts up for Renewal	100	100	100	100	100	100	100	100	100	100	100	100	100	1200	300	300	300	300
1.2.26	# Contracts Renewed	90	90	90	95	95	95	95	96	96	96	97	97	97	1134	270	285	288	291
1.2.27*	Contract Renewal Rate	92.0%	90.0%	90.0%	90.0%	95.0%	95.0%	95.0%	96.0%	96.0%	96.0%	97.0%	97.0%	97.0%	94.5%	90.0%	95.0%	96.0%	97.0%
1.2.31	% Performance Against SLA	96.0%	70.0%	75.0%	80.0%	92.0%	91.0%	93.0%	92.0%	94.0%	94.0%	95.0%	96.0%	94.0%	88.7%	93.0%	92.0%	93.3%	95.0%
1.2.43	Total Response Time (Min)	6000	6200	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	60167	60667	60000	60000	60000
1.2.28*	Average Response Time (Min)	75	60	62	60	50	50	50	46	46	43	43	40	40	49	61	50	45.0549	40.8524
1.2.42	Total SR Resolution Time (Min)	18000	19500	19500	19500	19500	19500	19500	19500	19500	19500	19500	19500	19717	19000	19500	19500	20582	
1.2.29*	Average SR Resolution Time (Min)	15	18	20	20	16	16	16	15	15	14	16	13	13	16	19	16	15	14
Customer Survey																			
1.2.33	Accuracy of Solution	70.0%	75.0%	80.0%	82.0%	81.0%	83.0%	84.0%	88.0%	85.0%	87.0%	82.0%	81.0%	81.5%	75.0%	82.0%	85.7%	83.3%	
1.2.34	Timeliness of Solution	70.0%	75.0%	80.0%	83.0%	86.0%	81.0%	88.0%	85.0%	86.0%	87.0%	81.0%	82.0%	82.0%	75.0%	83.3%	86.3%	83.3%	
1.2.35	Responsiveness	75.0%	75.0%	80.0%	82.0%	83.0%	85.0%	86.0%	87.0%	89.0%	88.0%	89.0%	89.0%	84.0%	76.7%	83.3%	87.3%	88.7%	
1.2.36	Rate IVR Ease of Use	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	
1.2.37	Rate our Status Updating	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	
1.2.38	Did you Attempt to Use Level 0	20.0%	20.0%	23.0%	23.0%	24.0%	23.0%	25.0%	26.0%	27.0%	26.0%	24.0%	24.0%	23.8%	21.0%	23.3%	26.0%	24.7%	
1.2.39	Customers Very Satisfied	40.0%	41.0%	47.0%	45.0%	42.0%	43.0%	44.0%	47.0%	41.0%	52.0%	54.0%	52.0%	45.7%	42.7%	43.3%	44.0%	52.7%	
Customer Sat. Goal																			
1.2.40	Completed Surveys	260	257	289	302	322	310	298	333	324	343	321	331	3690	806	934	955	995	
1.2.41*	Customer Sat. Rating	9.0	8.8	8.8	8.8	8.9	8.9	8.9	9	9	9	9.1	9.1	9.1	9.0	8.8	8.9	9.0	9.1

Figure 1.5 Balanced Scorecard Service Model 2

Ref. #	Category	Target	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD	Q1FY98	Q2FY98	Q3FY98	Q4FY98
Customer Sat. Metrics																			
ACD Data																			
1.2.1	Calls Received		1800	1800	1800	2100	2100	2100	2200	2200	2300	2300	2500	2500	25700	5400	6300	6700	7300
1.2.2	Calls Answered		1500	1500	1500	1800	1800	1800	1950	1950	2100	2100	2250	2250	22500	4500	5400	6000	6600
1.2.4	ASA		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
1.2.6	Abandon Calls		300	300	300	300	300	300	250	250	200	200	250	250	3200	800	900	700	700
1.2.8*	Abandon Call %	5.0%	16.7%	16.7%	16.7%	14.3%	14.3%	14.3%	11.4%	11.4%	8.7%	8.7%	10.0%	10.0%	12.5%	16.7%	14.3%	10.4%	9.6%
Call Mgt. Sys. Data																			
1.1.3*	Total Closed SRs		1000	1000	1000	1200	1200	1200	1300	1300	1400	1400	1500	1500	15000	3000	3600	4000	4400
1.2.14	SRs Closed/Initial Contact		600	672	723	823	800	801	833	854	842	810	891	789	9438	1995	2424	2529	2490
1.2.15	SRs Reopened		22	34	21	41	32	35	45	33	12	21	22	29	347	77	108	90	72
1.2.16	SRs Escalated		52	141	162	159	104	189	199	191	210	257	222	287	2333	455	512	600	766
1.2.17*	% SRs Closed/Initial	80.0%	60.0%	67.2%	72.3%	66.6%	66.7%	66.8%	64.1%	65.7%	60.1%	57.9%	59.4%	52.6%	62.9%	66.5%	67.3%	63.2%	56.6%
1.2.18*	% SRs Reopened	2.0%	2.2%	3.4%	2.1%	3.4%	2.7%	2.9%	3.5%	0.9%	1.5%	1.5%	1.9%	2.3%	2.6%	3.0%	2.3%	1.6%	
1.2.19*	% SRs Escalated	12.0%	15.2%	14.1%	16.2%	13.3%	13.7%	15.8%	15.3%	14.7%	15.0%	18.4%	14.8%	19.1%	15.6%	15.2%	14.2%	15.0%	17.4%
1.2.25	# Contracts up for Renewal		100	100	100	100	100	100	100	100	100	100	100	100	1200	300	300	300	300
1.2.26	# Contracts Renewed		90	90	90	95	95	95	96	96	96	97	97	97	1134	270	285	288	291
1.2.27*	Contract Renewal Rate	92.0%	90.0%	90.0%	90.0%	95.0%	95.0%	95.0%	96.0%	96.0%	96.0%	97.0%	97.0%	97.0%	94.5%	90.0%	95.0%	96.0%	97.0%
1.2.31	% Performance Against SLA	96.0%	70.0%	75.0%	80.0%	92.0%	91.0%	93.0%	92.0%	94.0%	94.0%	95.0%	96.0%	94.0%	88.7%	93.0%	92.0%	93.3%	95.0%
1.2.43	Total Response Time (Min)		6000	6200	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000	60167	60667	60000	60000	60000
1.2.28*	Average Response Time (Min)	75	60	62	60	50	50	50	46	46	43	43	40	40	49	61	50	45.0549	40.8524
1.2.42	Total SR Resolution Time (Min)		18000	19500	19500	19500	19500	19500	19500	19500	19500	19500	19500	19717	19000	19500	19500	20582	
1.2.29*	Average SR Resolution Time (Min)	15	18	20	20	16	16	16	15	15	14	16	13	13	16	19	16	15	14
Customer Survey																			
1.2.33	Accuracy of Solution		70.0%	75.0%	80.0%	82.0%	81.0%	83.0%	84.0%	88.0%	85.0%	87.0%	82.0%	81.0%	81.5%	75.0%	82.0%	85.7%	83.3%
1.2.34	Timeliness of Solution		70.0%	75.0%	80.0%	83.0%	86.0%	81.0%	88.0%	85.0%	86.0%	87.0%	81.0%	82.0%	82.0%	75.0%	83.3%	86.3%	83.3%
1.2.35	Responsiveness		75.0%	75.0%	80.0%	82.0%	83.0%	85.0%	86.0%	87.0%	89.0%	88.0%	89.0%	89.0%	84.0%	76.7%	83.3%	87.3%	88.7%
1.2.36	Rate IVR Ease of Use		60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
1.2.37	Rate our Status Updating		70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%	70.0%
1.2.38	Did you Attempt to Use Level 0		20.0%	20.0%	23.0%	23.0%	24.0%	23.0%	25.0%	26.0%	27.0%	26.0%	24.0%	24.0%	23.8%	21.0%	23.3%	26.0%	24.7%
1.2.39	Customers Very Satisfied		40.0%	41.0%	47.0%	45.0%	42.0%	43.0%	44.0%	47.0%	41.0%	52.0%	54.0%	52.0%	45.7%	42.7%	43.3%	44.0%	52.7%
Customer Sat. Goal																			
1.2.40	Completed Surveys		260	257	289	302	322	310	298	333	324	343	321	331	3690	806	934	955	995
1.2.41*	Customer Sat. Rating	9.0	8.8	8.8	8.8	8.9	8.9	8.9	8.9	9.0	9.0	9.0	9.1	9.1	9.1	9.0	8.8	8.9	8.9

Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD	Q1FY97	Q2FY97	Q3FY97	Q4FY97
Ending Headcounts																	
Indirect HC																	
Managers	1	1	1	1	1	1	1	1	1	1	1	1	NA	1	1	1	1
Supervisors	1	1	1	1	1	1	1	1	1	1	1	1	NA	1	1	1	1
Administrators	1	1	1	1	1	1	1	1	1	1	1	1	NA	1	1	1	1
Contractors	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Indirect HC	3	3	3	3	3	3	3	3	3	3	3	3	NA	3	3	3	3
Total Indirect Budget HC	7	7	7	7	7	7	7	7	7	7	7	7	NA	7	7	7	7
Total Over/Under Budget	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	-4	NA	-4	-4	-4	-4
Direct HC																	
Support Techs	5	5	5	7	5	7	7	7	9	7	10	8	NA	5	7	9	8
SMEs	3	3	3	3	3	3	3	3	3	3	3	3	NA	3	3	3	3
Product Specialist	1	1	1	1	1	1	1	1	1	1	1	1	NA	1	1	1	1
Contractors	1	1	1	1	1	1	1	1	1	1	1	1	NA	1	1	1	1
Total Direct HC	10	10	10	12	10	12	12	12	14	12	18	12	NA	10	12	14	12
Total Direct Budget HC	11	11	11	12	12	12	12	13	14	14	15	15	NA	11	12	14	15
Total Over/Under Budget	-1	-1	-1	0	-2	0	0	-1	0	-2	3	-3	NA	-1	0	0	-3
Total Ending Headcount	13	13	13	15	13	15	15	15	17	15	21	15	NA	13	15	17	15
Total Budget Headcount	18	18	18	19	19	19	19	20	21	21	22	22	NA	18	19	21	22
Total Over/Under Budget	-5	-5	-5	-4	-6	-4	-4	-5	-4	-6	-1	-7	NA	-5	-4	-4	-7
Summary																	
Direct/Total HC Ratio	76.9%	76.9%	76.9%	80.0%	76.9%	80.0%	80.0%	80.0%	82.4%	80.0%	85.7%	80.0%	79.6%	76.9%	80.0%	82.4%	80.0%
Directs/Mgr Ratio	10.0	10.0	10.0	12.0	10.0	12.0	12.0	12.0	14.0	12.0	18.0	12.0	12.0	10.0	12.0	14.0	12.0
Directs/Supervisor Ratio	10.0	10.0	10.0	12.0	10.0	12.0	12.0	12.0	14.0	12.0	18.0	12.0	12.0	11.0	12.0	14.0	15.0
FTEs	10	10	10	11	11	11	12	12	13	13	15	15	11.9	10.0	11.0	12.3	14.3
Total DLH	1124	1128	1137	1237	1237	1137	1337	1337	1437	1437	1537	1592	15677	3389	3611	4111	4566
Paid Days	23	20	21	22	22	21	23	21	22	23	20	23	261	64	65	66	66
Non Available Time	300	330	250	220	200	250	320	275	300	330	320	321	320	880	670	895	971
Acid Utilization Rate	61.1%	70.9%	67.7%	63.9%	63.9%	61.5%	60.6%	66.3%	62.9%	60.1%	64.0%	57.7%	63.0%	66.2%	63.1%	60.3%	60.3%
Net Utilization Rate	73.0%	88.8%	79.5%	72.1%	71.3%	71.2%	70.8%	76.8%	72.3%	69.7%	73.9%	65.3%	63.6%	79.9%	71.5%	73.2%	69.2%

Figure 1.8 Balanced Scorecard Service Model 5

The initial design should be kept simple. It provides time for all staff to assimilate a better understanding of the model and how certain actions or results will drive other numbers. For example, average direct labor hours (DLH) per closed service request is, in a way, a ‘contra KPI.’ Most managers will focus on some form of utilization rate, such as an acid utilization rate (measured in the appendix as total DLH for the period divided by paid hours). The industry average for acid utilization rate is between 55% and 60%. However, if the acid utilization rate increases during a certain period but both the support engineer headcount and workload (measured as total closed service requests) stays constant, then there may be an issue with:

- product quality (e.g. a new product release)
- a significant increase in off time (e.g. vacation, sick, holiday, training, etc.)
- new staff coming up to speed as a result of turnovers, etc.

This highlights an important point about the Balance Scorecard Service Model. It does an excellent job of pointing out current or future potential problems with the business; however, it rarely identifies the cause. Finding the root cause will often require more in-depth analysis. It is very likely to require more discussion with the Support Center management team, its engineers and, most importantly, its customers.

A simple design will also allow time to establish a more automated way to gather the data. Most Support Center operations will use a basic spreadsheet application (e.g. Excel, Lotus 123, etc.) to lay out the initial model. The model itself is broken down into a segment for each of the quadrants of the Balanced Scorecard Service Model, plus a headcount segment and a general summary management segment, which will summarize the high level KPIs against each of the goals on a single sheet.

In the model, the goals are highlighted in yellow. Blue designates a calculation and/or an automated feed from another sheet in the workbook. Black denotes specific input fields. The individual sheets themselves are broken down to show industry average (if known) and a targeted result for individual goals and metrics. Results are looked at monthly, quarterly, and year to date for each metric and goal. Generally, the longer the period of time, the less

fluctuation in the results and the smoother the curve of any trend line. Some models will use 15 months and five quarters to allow for a comparative to the previous year's month or quarter results.

1.3 Ongoing operations

When considering ongoing operations of the Balanced Scorecard Service Model, it is important to keep in mind that the Support Center Manager is responsible for the day-to-day knowledge and operations. This means that the focus of metrics for the Support Center Manager will be at a more detailed level. As management levels increase, the amount of detail presented takes on less significance as the 'big picture' becomes more important. Figure 1.9 illustrates management level focus for metrics.

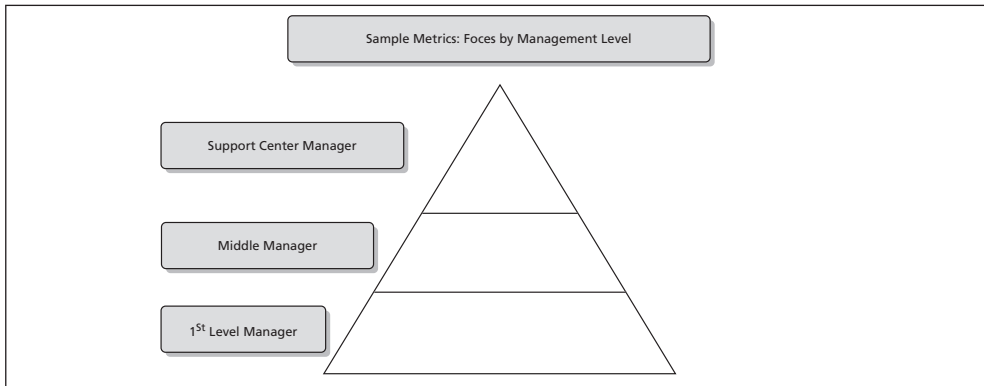


Figure 1.9 Sample metrics: focus by management level

As noted in the Implementation phase, as the organization evolves and learns how to use the Balanced Scorecard Service Model, the model will evolve into an even more powerful tool to manage the overall Support Center operation. This model can be used to manage current operational effectiveness; importantly, it can also use other forecast data to project and optimize future operations.

1.3.1 Advanced application of the Balanced Scorecard Service Model

The Balanced Scorecard Service Model outlined in figures 1.4 - 1.8 can also be broken down by products as well as by organizational support location. For example, as outlined in figure 1.10, it is possible to look at the model for a given site location by Product A or Product B in say Latin America and compare their performance with another location for the same product. Performance can be compared by site and by product; performance can also be consolidated for all sites by product. This capability will identify 'best of breed' within an organization relative to performance, which allows the organization to learn and implement its own internal best practices across the broader support organization.

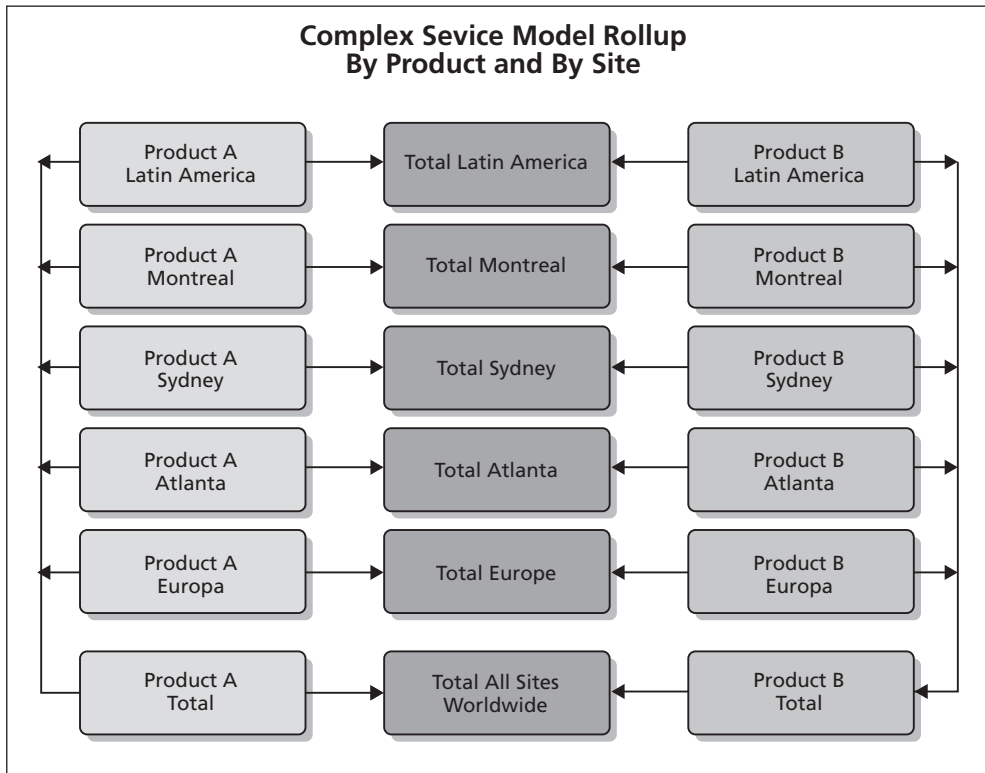


Figure 1.10 Performance comparisons by product and by site

1.3.2 Using the Balanced Scorecard Service Model to measure ROI

Another major feature of the Balanced Score Card Service Model is that it allows support managers to build and use effective ROI models. These models can be used to show productivity gains generated (or not) through revised workflow processes, as well as for the justification of new productivity tools. For example, this could include 'knowledge aggregation' technologies, Web-based remote control tools, remote proactive 'phone home' technologies, voice recognition technologies etc.

Most support managers fail to take the second step in the ROI process, which involves proving the projected ROI after the fact. What this means is actually reporting back to senior management in the capital approval process if ROI objectives are reached. Besides validating the original ROI assumptions, this strategy automatically increases the prospects for approval of future projects if results are communicated back to the senior management who approved the investment.

The Balanced Scorecard Service Model can be used to demonstrate that these investments will increase productivity by:

- lowering either the number of incidents per contract or customer (or user for internal Support Centers)
- lessening the DLH per incident (as well as the elapsed time)
- improving closed incidents on initial contact rates etc.

The Balanced Scorecard Service Model can also show improvements in customer satisfaction, through hard survey score results or 'soft' results via customer survey interviews.

On occasion, in place of actually purchasing a technology solution, Support Center Managers may elect to use an applications software provider (ASP) or lease hardware. Regardless of how technology solutions are purchased, the Balanced Scorecard Service Model design provides a viable and measurable ROI model that is directly applicable to each Support Center environment.

1.3.3 Support Engineer Report Cards

The Balanced Scorecard Service Model can be broken down by site and product; it can also be modified and driven all the way down to the individual contributor. Figure 1.11 illustrates a sample Support Analyst Report Card. In this example, the report card is broken down into three major segments based on workload, customer satisfaction and non-direct time. The workload segment looks, by month, at:

- the number of incidents opened and closed
- bug escalations (called product advice reports or PARs in this sample)
- direct labor hours, hours available (paid hours less vacation, sick time, holiday, or training), paid hours and utilization rates [both acid (DLH/paid hours) and net DLH/hours available].

Figure 1.11 also looks at the number of transactional surveys that were completed based on incidents closed by this particular support engineer and further looks at incidents by individual question. Figure 1.11 is an Excel spreadsheet; however, there are a number of excellent Web-based business intelligence (BI) tools on the market that would allow full drill-down into each line of the Support Analyst Report Card. For example, it is easy to look at individual customer surveys and comments by support engineer from the individual report cards.

The final segment of this example looks at the indirect time breakdown by month. This report card ties back to the Balanced Scorecard Service Model, thus driving the goals of the Balanced Scorecard Service Model all the way through the organization to the individual support engineer. It also provides managers with a very effective and objective tool for individual support engineer performance reviews.

Month	Cases		Backlog		Direct Labor	Hours		Utilization Rates		Surveys						
	Created	Closed	Nonpar	Par		Available	Paid	ACID	NET	Number	Timelines	Solution	Communication	Courtesy	Overall	Avg Score
January	138	72	11	0	77.54	136	160	48.5%	57.0%	0						
February	163	81	20	0	113.42	156	160	70.9%	72.7%	5	4,400	4,800	4,800	5,000	4,800	4,760
March	162	90	10	0	138.27	144	200	69.1%	96.0%	2	4,500	4,500	4,500	4,500	4,500	4,500
April	137	69	15	0	104.09	152	160	65.1%	68.5%	1	4,000	5,000	4,000	4,000	4,000	4,200
May	132	72	10	0	86.09	152	160	53.8%	56.6%	1	4,000	4,000	4,000	4,000	4,000	4,000
June	147	71	14	0	98.06	156	200	49.0%	62.9%	0						
July	105	49	6	0	154.46	136	160	96.5%	113.6%	0						
August	117	56	8	0	85.42	140	160	53.4%	61.0%	5	4,800	5,000	4,600	4,800	4,750	4,792
September																
October																
November																
December																
Average	137.63	70.00	11.75	0.00	107.17	146.5	170	63.0%	73.2%	1.8	4,500	4,786	4,571	4,714	4,625	4,640
YTD - Sum	1101.00	560.00			857.35	1172	1360			14						
Grp FTE Avg / mo	64.6	26.0	5.0	0.0	51.5	141.1	169.3	30.4%	36.5%	0.5	4,438	4,400	4,188	4,738	4,200	4,390

Grp Avg / mo	242	98	18,625	0	193	529	635	30.4%	36.5%	2	4,438	4,400	4,188	4,738	4,200	4,390
Grp Tot / yr	1939	780			1546	4232	5080			16						

Site Avg / mo	8261	8887	1215	294	11102	17793	21103	52.6%	62.4%	211	4,270	4,320	4,411	4,610	4,336	4,407
Site Tot / yr	66090	71096			88817	142346	168820			1687						

	Train	Sick	Vac	Comp	Per	Float	Hol	Other
January	0	0	16	0	0	0	8	0
February	0	4	0	0	0	0	0	0
March	32	16	0	0	0	8	0	0
April	0	0	0	0	0	8	0	0
May	0	8	0	0	0	0	0	0
June	12	0	8	8	8	0	8	0
July	0	0	16	0	0	0	8	0
August	0	8	12	0	0	0	0	0
September								
October								
November								
December								

Figure 1.11 Report Card Sample

1.4 Sustaining the process

The last step in the process involves periodic Support Center-driven operational reviews. Ideally, these should be performed quarterly. Monthly reviews at the summary level are too frequent and yearly reviews come too late to effect necessary changes to meet organizational goals.

Items covered in this operational review should include:

- the previous quarter's operational performance
- trend lines for goals and supporting major KPIs
- projections for future Balanced Scorecard Service Model Goals
- issues or concerns that may impact future performance
- product road map and/or new service offerings
- general overview of the business by senior corporate management
- review of past quarterly action items and new action items for the current period review
- awards and recognition for performance or contribution to the success of the operation

Another objective of the Balanced Scorecard Service Model is to set long-term performance targets for the Balanced Scorecard Service Model Goals. These performance targets should be aggressive but still be attainable by the organization.

Figure 1.12 provides a pictorial example of setting up long-term goals and then using the quarterly operational review process to monitor performance against those goals.

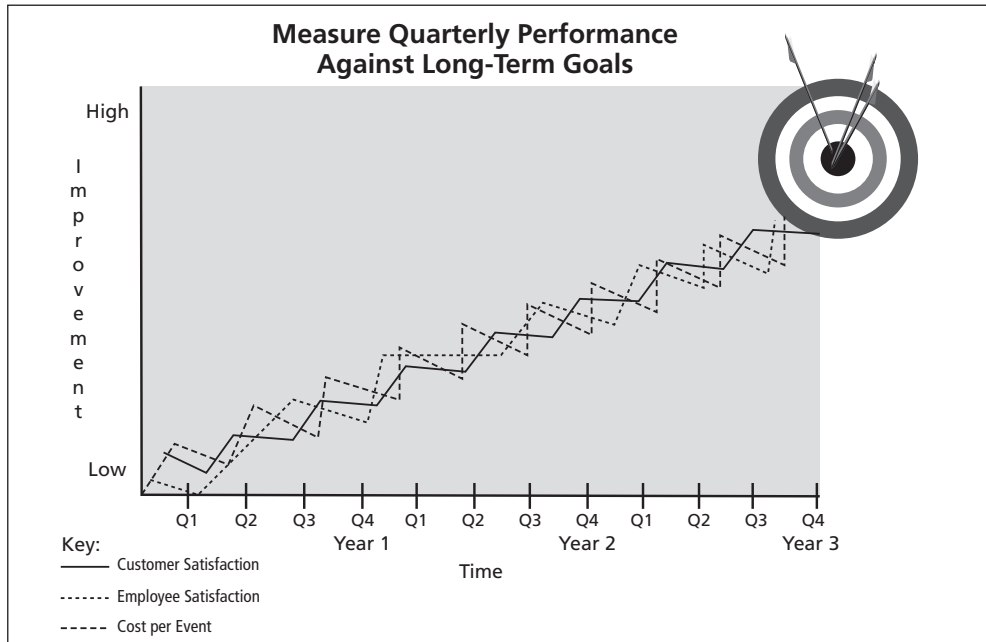


Figure 1.12 Quarterly measurement against long-term goals

The quarterly operational review process is iterative in nature. It may involve a local site or first-level manager review given to mid-level managers and the Support Center Manager. Second-level Support Center Managers may then do a formal review to the senior services managers with the Support Center Manager. This process is extremely effective in educating senior services managers at the vice president level and higher in the organization, and provides the Support Center or IT department with an even stronger link to senior corporate management. Figure 1.13 gives a simple overview of what this might look like.

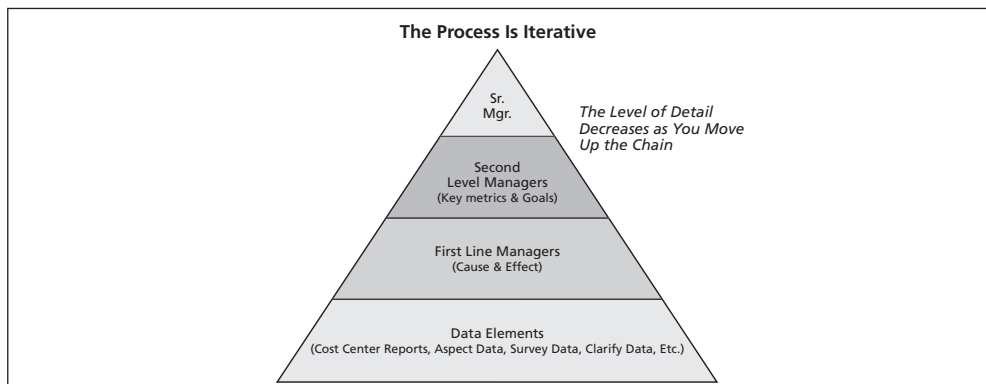


Figure 1.13 Operational review process

Operational reviews may include the following:

- first and second-level support managers, as well as the Support Center directors and above
- IT service delivery managers or business analysts who directly support the Support Center service delivery technology infrastructure (e.g. knowledgebases, CRM systems, voice and data networks etc.)
- HR managers for the Support Center
- educational services managers who directly support the Support Center
- product planning representatives
- product engineering representatives
- financial managers who directly support the Support Center
- the executive vice president of services (and occasionally Management Committee level executives).

The executive vice president of services should always start the meeting with a review of the past quarter's performance from an overall services perspective, then discuss the up-coming quarter or other significant events that are being planned at a corporate level.

Other representatives from the supporting staff organizations (e.g. HR, product planning, etc.) should be asked to give periodic presentations at the quarterly operations review when they have relevant, significant information that could or would affect the overall Support Center's current or future operations.

1.5 Summary

The key to the successful financial/operational management of Support Center operation deals with establishing a goal-based Balanced Scorecard Service Model. The goals established in this Balanced Scorecard Service Model should be agreed to by the Support Center Manager with the executive vice president of services for the organization. These goals should be linked directly to specific corporate-level goals. The Balanced Scorecard Service Model goals themselves, while separate, should be treated and managed as a whole. Long-range performance targets should be established for each goal and reported against as part of a formal quarterly operational review process. The objective is to have continuous, balanced improvement in all service goals.

While KPIs are important, managers should use them as a tool to help them understand where they may have an opportunity to improve the existing organization by pointing out potential issues. KPIs are management tools and not necessarily objectives. Reward systems need to be based on the goals of the Balanced Scorecard Service Model, and not the KPIs, to ensure that proper behavior is driven throughout the organization.

In setting up a Balanced Scorecard Service Model, establish goals first. Choose only those goal-related KPIs that will have the highest value initially, which should help keep the initial Balanced Scorecard Service Model simple. As a better understanding of the potential of the Balanced Scorecard Service Model is achieved, add more KPIs as necessary. When starting out, keep Balanced Scorecards simple. The level of detail included will increase as you move to lower levels of the organization.

Report cards should be used to drive the Balanced Scorecard Service Model concepts through to the individual contributor level to ensure end-to-end organizational alignment throughout the organization, whether it is a simple single Support Center or an international grouping of multiple Support Centers. A Balanced Scorecard approach ensures that goals are balanced and aligned with the real world of multiple priorities.

In a mature design, the Balanced Scorecard Service Model can be further broken down by organizational structure and by product structure. At the product level, the model becomes even more effective. It is generally easier to project the impact of future sales by product, making the workload as well as the number of FTEs and required skill sets easier to forecast. The impact of product quality is also more easily demonstrated when the model is broken down to the product level. The impact of a bad release can now be objectively presented back to the engineering organization or vendor.

Overall, the effective design, evolution and proper management of the Support Center Balanced Scorecard Service Model process are the most important steps toward the development of a world-class Support Center operation. This is true of operations ranging from a simple internal IT Support Center to a larger multi-customer Support Center organization.

Annex A1.1 Balanced Scorecard quadrants

This annex provides details of the four quadrants of the Balanced Scorecard - Customer Satisfaction, Employee Satisfaction, Costs/Productivity Goals and Organizational Maturity.

A1.1.1 Customer Satisfaction Quadrant - Goals and Key Performance Indicators

This table is only a guideline. Users should feel free to redefine any definitions or sources listed above. However, they should maintain and distribute a documented copy to all users of this information.

Balanced Scorecard Service Model Area	KPI or Goal Name	Definition	Potential Source
Customer Satisfaction	Total Calls Received	Total Calls Received by the ACD.	ACD
Customer Satisfaction	Total Calls Answered	Total Calls Answered.	ACD
Customer Satisfaction	Customer Satisfaction Rating	This is usually the 'Overall' rating question on a customer survey. The actual calculation of the period score should be done via weighted average.	Customer Survey System
Customer Satisfaction	Completed Surveys	These would be the total completed surveys for the period.	Customer Survey System
Customer Satisfaction	Average Speed of Answer (ASA)	ASA is the time from the first ring to the time the customer speaks to a live agent. Includes time customer spent on IVR.	ACD
Customer Satisfaction	Abandon Calls	Calculated by taking 'Total Calls Received' and subtracting 'Total Calls Answered.'	Calculation (or ACD Rpt)
Customer Satisfaction	Abandon Call %	Calculated by dividing 'Total Calls Abandon' by Total Calls Received.'	Calculation
Customer Satisfaction	Incidents Closed/Initial Contact	Total incidents closed on initial contact with a support rep.	Call Management & Tracking System (CMTS). Examples include Clarify, Heat, Remedy

Customer Satisfaction	Incidents Reopened	Total Closed Incidents reopened during that period.	CMTS
Customer Satisfaction	Incidents Escalated	Total incidents escalated for that period.	CMTS
Customer Satisfaction	% Incidents Closed/Initial	Calculated by dividing 'Total Incidents Closed on Initial Contact' by 'Total Closed Incidents' for that same period.	Calculation
Customer Satisfaction	% Incidents Reopened	Calculated by dividing 'Total Incidents Reopened' by 'Total Closed Incidents.'	Calculation
Customer Satisfaction	% Incidents Escalated	Calculated by dividing 'Total Incidents Escalated' by 'Total Closed Incidents' for the same period.	Calculation
Customer Satisfaction	Total Response Time	Total time from the time a call is left in a CMTS queue until the support person makes initial contact with the customer.	CMTS
Customer Satisfaction	Average Response Time	"Total Response Time' divided by 'Total Closed Incident' for that period.	CMTS
Customer Satisfaction	Total Incident Elapsed Time	Total elapsed time (based on a 7x24 hour wall clock) from when the Incident was opened until it was closed.	CMTS
Customer Satisfaction	Average Incident Resolution / Elapsed Time (Min)	Calculated by dividing 'Total Resolution/Elapsed Time' by 'Total Closed Incidents' for a specific period.	CMTS
Customer Satisfaction	# Contracts Up for Renewal	Total number of contracts that will be expiring or up for renewal this period.	CMTS or Contract Mgt System
Customer Satisfaction	# Contracts Renewed	Total number of contracts renewed this period.	CMTS or Contract Mgt System
Customer Satisfaction	Contract Renewal %	Calculated by dividing 'Total Contracts Renewed' by 'Total Contracts' up for Renewal.	Calculation

Customer Satisfaction	% Performance Against SLA	This is measured as a percent of performance against SLA goals. This will be a unique measure to each group based on their specific SLA goals (e.g., response times, resolution times, etc.).	CMTS or Contract Mgt System
Customer Satisfaction	Self-service utilization	Customer (user) use of self-service tools	Since most customers / user will not tell you if they were able to provide their own self server one of the better alternatives is to measure over time the average number of Direct Labor type events per user or contract. As self service increases the average number of events per user or contract will decrease.
Customer Satisfaction	Time to customer (user) proficiency of new technology	Amount of time necessary for average customer or user to become familiar with and able to use newly introduced technologies.	This could be a set time after the completion of the installation of this application and customer training. It could also be measured as the point where a new customer or user's average volume of incidents equals that for other customers using the same technology. In the later case the CMTS would be the primary system used to evaluate this measure.

A1.1.2 Employee Satisfaction Quadrant – Goals and Key Performance Indicators

This table is only a guideline. Users should feel free to redefine any definitions or sources listed above. However, they should maintain and distribute a documented copy to all users of this information.

Employee Satisfaction	Total Direct Headcount	Total Direct Headcount (Direct = Technical/Service Delivery).	HR Systems
Employee Satisfaction	Employee Satisfaction Rating	Employee satisfaction rating based on employee (period) survey score.	Employee Survey Process
Employee Satisfaction	# Turnovers (Directs)	Number of (technical) direct turnovers (Techs leaving the company).	HR Systems
Employee Satisfaction	# of Turnovers (Directs)	Number of direct people leaving the group but not the company.	HR Systems
Employee Satisfaction	Training Hours	Total formal classroom, Computer-Based Training (CBT), On the Job (OJT) training or other informal training time expended during the reporting period.	HR/ Time Tracking system or potentially CMTS
Employee Satisfaction	Average Training Hours per FTE	Calculated by dividing Total training hours by Total FTEs	Calculation
Employee Satisfaction	Total Performance Evaluations Scheduled	Total number of Performance Evaluations scheduled for a given period.	HR Systems
Employee Satisfaction	Total Performance Evaluations Completed	Total number of Performance Evaluations completed in a given period.	HR Systems
Employee Satisfaction	% Scheduled Performance Evaluations Completed	Percent of total Performance Evaluations completed in a given period divided by Total Performance Evaluations scheduled for that same period.	Calculation
Employee Satisfaction	# Employee Surveys	Total employee satisfaction surveys during the period.	Employee Survey Process
Employee Satisfaction	Time to employee proficiency	Time from actual start date to the point where an employee is capable of performing basic support functions	Employee Evaluation / Training Plans

Employee Satisfaction	Knowledge contribution	Total knowledge articles or content produced over a given period of time. This could be based on specific individual targets noted in employee job description. This measure is usually limited to Support Center employees classified as direct.	Knowledge or other select content based reporting systems
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A1.1.3 Costs/Productivity Goals and Key Performance Indicators

This table is only a guideline. Users should feel free to redefine any definitions or sources listed above. However, they should maintain and distribute a documented copy to all users of this information

Costs/ Productivity	Ending Customers	The total ending customer (user) counts at the end of a given period.	CMTS
Costs/ Productivity	Average Customers	This is average of the past period ending customer count and the current period ending customer count.	Calculated
Costs/ Productivity	Total Incidents closed.	The total closed incidents for the current period.	CMTS
Costs/ Productivity	Average Cost per incident	Calculated by dividing 'Total Costs' by 'Total Incidents Closed' for the same period.	Calculation
Costs/ Productivity	Total Closed Incident Direct Labor Hours (DLH)	The Direct Labor Hours (time) logged against incidents closed during the period.	CMTS
Costs/ Productivity	Average incidents per Customer	Calculated by dividing the 'Total closed Incidents' by 'Average Customers' for the same period.	Calculation
Costs/ Productivity	Average Cost per Customer	Calculated by dividing 'Total Costs' by 'Average Customers' for the same period.	Calculation
Costs/ Productivity	Average Customers per FTE	Calculated by dividing the 'Average Customers' by 'FTEs' for the same period.	Calculation
Costs/ Productivity	Closed Incidents per FTE	Calculated by dividing the 'Total Closed Incidents' by the total 'FTEs' for the same period.	Calculation

Costs/ Productivity	FTEs	Headcount expressed in Full Time Equivalent (FTE) providing support. (Reserved for Full Time Technical Equivalents. Calculated by averaging the ending Technical headcount over two consecutive periods.)	HR System
Costs/ Productivity	Travel DLH	Travel time for Direct Personnel	HR/ Time Tracking system or potentially CMTS
Costs/ Productivity	Project-Related DLH	Special Project time for Direct Personnel	HR/ Time Tracking system or potentially CMTS
Costs/ Productivity	Total DLH	This field is calculated by adding all DLH associated with remote telephone support, desk side and onsite support and project related support.	Calculated
Costs/ Productivity	Utilization Rate (ACID)	Calculated by multiplying the 'FTEs' for the period by the paid days for the same period times 8 (hours) and dividing that figure into the 'Total DLH' for the period.	Calculation
Costs/ Productivity	Average DL per Incident (Min)	Calculated by dividing the total completed incident direct labor by total completed incidents for the same period. Expressed in minutes.	Calculation
Costs/ Productivity	Cost per Average DLH	Calculated by dividing the 'Total Costs' by the 'Total DLH' for the same period.	Calculated
Costs/ Productivity	Paid Days	This field is the actual paid days for a given period and it does include holidays.	HR/ Time Tracking system or potentially CMTS
Costs/ Productivity	Non Available Time	This is all time related to Holidays, Vacation, Sick Time, Disability Leave and Training.	HR/ Time Tracking system or potentially CMTS

Costs/ Productivity	Utilization Rate (Net)	This is calculated exactly the same as Acid Utilization Rate however all Non- Available time is subtracted from (the period's) Paid Days.	Calculation
Costs/ Productivity	Total Costs (These costs are for the reporting group / product team only)	Total costs of running the operation. This is a fully burden cost as reporting on a department budget, cost report. This figure should include at least the first level overhead allocation for the indirect groups (i.e. management cost centers) directly associated with the line support organization.	Financial Systems (i.e. Cost Center Reports and/or Allocation reports)
Costs/ Productivity	Cost per FTE	Calculated by dividing the 'Total costs' by 'FTEs' for the same period.	Financial Systems (i.e. Cost Center Reports and/or Allocation reports)
Costs/ Productivity	Revenue generated per employee	Total Contract or other revenue generated by Support Center divided by total Support Center employees (direct + indirect)	Calculation
Costs/ Productivity	Percent of budget	Total actual costs divided by budgeted actual costs for the same period. Express as a percentage.	Calculation

A1.1.4 Organizational Maturity and Key Performance Indicators

This table is only a guideline. Users should feel free to redefine any definitions or sources listed above. However, they should maintain and distribute a documented copy to all users of this information.

Organizational Maturity	Executive support of the Support Center	Overall backing and patronage of the Support Center by executive management	Executive use of the Support Center and outward promotion to remainder of organization by executive management
Organizational Maturity	Time to fill knowledge gaps	Time to identify and document problems and solutions; time for knowledge to be available for use by Support Center staff.	Average time from rough knowledge content creation to final edited and published content
Organizational Maturity	Time to new product Proficiency	Length of time it takes for the Support Center to be proficient on new products.	This could be measured by the average DLH per incident. During initial release the average DLH per incident will be high initially but should stabilize as the ship volumes increase and the technical support engineers gain familiarity with the new product. During this period additional feedback to the development group from support should enable development to make additional modifications that will help to stabilize the new product itself and further lower DLH per incident.
Organizational Maturity	Flexibility of costs to changes in workload	Ability of the Support Center to change the cost structure (up or down) as work varies.	Business contracts, SLAs, operational budgets, etc.

Organizational Maturity	Diversity	The value of diversity within and throughout the support organization and localization considerations.	HR Systems, internal Affirmative Action Plans, etc.
Organizational Maturity	Work elimination through Problem Management and Change Management	Tracking the cost savings resulting from identification and elimination of known errors.	Root Cause Analysis programs
Organizational Maturity	Formalization of IT processes	Tracking indicators that the support organization has integrated all support processes with processes of other IT functional areas	Support Center procedural documentation and the integration of IT/IS into the formal Support Center operational review process

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Chapter 2:

Knowledge Management

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2.1 Overview

2.1.1 Description

Knowledge Management has been described as many things, from managing ignorance to managing intellectual property. It is a set of guiding principles related to managing information (building and maintaining information for re-use) with the underlying tenet of information in context.

Without context, information has little value. All knowledge is shaped by context and people rely on education and experience to make sense of it. The sense they make of it (or put another way, the depth of understanding) differs from person to person, depending on their education and experience. Communities of end-users with a specific interest or requirement are a key element in creation and dissemination of knowledge; though they are not the reason for a knowledge environment, they do provide focus and energy.

Much of the content of this chapter is based upon the work of the Consortium for Service Innovation. The Consortium has studied Knowledge Management for over a decade. HDI has worked with the Consortium to build standards and courseware to assist organizations implement successful Knowledge Management strategies. The Consortium's methodology for Knowledge Management is Knowledge Centered Support (KCSSM). The objective of the KCS methodology is the collection, categorization, ongoing administration, dissemination and use/re-use of knowledge in the incident resolution process.

2.1.2 Why Knowledge Management is an executive issue

Understanding the flow of knowledge and information is key to success. Systems can mine gargantuan databases to establish patterns and distil information that a human could never find in several lifetimes. However, even the most advanced artificial intelligence is no substitute for what has been described as 'the human glue' that provides context and allows inferences to be accurately - or inaccurately - made.

Libraries are the old-fashioned knowledge repositories. However the principles of managing that repository are as valid today as it was 100 years ago. Who better to understand the need to organize, index and maintain massive databases than librarians? Long-term productivity depends on both investment and growth of knowledge assets. Connecting information flows, identifying and eradicating duplication of effort, streamlining data collection and distribution...all these things are crucial to managing an efficient and productive organization. All of these elements are enabled by managing information, knowledge, as an asset.

Corporate culture determines the success of any Knowledge Management initiative - executive attention is necessary. At the most basic level, there are three facets of Knowledge Management that executives must address - culture, process and technology.

Culture

Culture is led from the top. If Knowledge Management is a priority, then the board and CIO must demonstrate commitment through investment and interest in the success of Knowledge Management initiatives. If there is a culture of 'us and them', then 'silo-working' becomes normal and entrenched; Knowledge Management initiatives will fail. The executive must encourage and recognize those who participate in the usage of knowledge, creation of knowledge and maintenance of knowledge.

Process

For Knowledge Management to be successful, the organization must adopt repeatable processes. This requires standards for building the knowledge structure; these will be presented later in this chapter. Everyone's roles in the knowledge process must also be clarified.

Technology

Knowledge Management tools - regardless of the platform or tool chosen - are critical to the success of Knowledge Management initiatives. But initiatives that are technologically focused will probably fail. Focus on culture and process issues first, and then look for the right technology. The technology selected must work within the organization's platform requirements, meet the needs of its end-users, provide quality monitoring and workflow processes appropriate to its needs, and most importantly will allow for knowledge to be built at 'the speed of conversation'. Knowledge Management tools should be tightly integrated with Incident Management tools to allow for knowledge capture during the resolution process.

The Support Center will also need to consider the risks inherent in failing to address Knowledge Management. Knowledge Management, or the failure to address Knowledge Management, will affect how the organization does business in terms of being efficient and agile.

The Chief Knowledge Officer at HP, Craig Samuel, was quoted in the Financial Times as saying that support of effective knowledge sharing was not a technology issue. Work processes, in his estimation, account for 20% of problems, with 70% being cultural issues. The conclusion is that only 10% of effective knowledge sharing is attributed to technology challenges.

2.1.3 Relationship to other processes

Knowledge Management primarily affects end-users. Within the Support Center and IT organization, it is Incident Management, Problem Management and Change Management that are most strongly related to (and with) Knowledge Management processes.

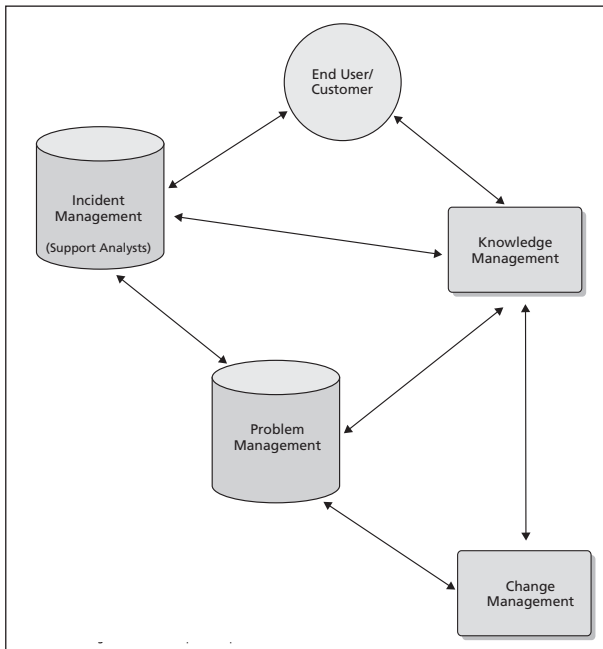


Figure 2.1 Relationship to other processes

2.2 Implementation

The goal of Knowledge Management is to simplify the process of capturing the incident descriptions and associated contextual information the first time information is gathered. Another goal of Knowledge Management is to resolve incidents in such a way that information can be easily re-used and referenced in the future. With these factors in mind, Knowledge Management will greatly enhance the productivity of the Support Center.

There are six key processes/concepts required for a successful Knowledge Management strategy. These are outlined below.

2.2.1 Capture context and incident descriptions in the workflow

Capture the context and incident description as the incident is being resolved. Capturing the customer's context (i.e., operating systems, hardware, and product) along with the user or customer's question or the incident definition is critical to the ability to find the solution in the future. If the customer's experience is not captured at the moment it is expressed, it will be lost. Solutions that are created after the fact (i.e. second or third level support) will be captured in the technical analyst's context, not the end-users/customer's context, thus reducing the chance of finding the solution in the future.

When the analyst receives an incident that they do not immediately know how to resolve, the knowledgebase should be referenced early in the process. The knowledgebase can provide information and answers to situations - or similar situations - that may have been previously addressed and/or resolved.

2.2.2 Structure knowledge for re-use

It is important to capture the contextual information along with the incident description. Words and phrases in the solution should contain complete thoughts, although they need not be complete sentences. It is important to distinguish between the incident or problem description, the environment and the resolution.

2.2.3 Searching becomes creating

If searching for a solution in the knowledgebase that is not found, save the vocabulary used in the search. The description of an issue is valuable even if it does not yet have a resolution. The resolution should be added when it is found. As analysts interact with the knowledgebase, the structured words and phrases are preserved. This is called a 'framed solution', which preserves the context of the incident in the requestor's terms. A framed solution in the knowledgebase can then be submitted to the appropriate people for resolution through the Problem Management process. When the resolution is determined it is simply added to the framed solution and finished. The process of framing and finishing solutions draws people into using the knowledgebase as the basis for incident solving, which in turn ensures that the collective experience of the organization is being captured and applied in the process of solving problems.

2.2.4 Just-in-time solution quality

If the analyst determines that a solution is good enough to deliver to a customer, that solution should be immediately available to the analyst's peers. If another analyst finds that solution, the analyst can review its appropriateness for the particular situation. The analyst may then modify or update the solution to ensure that it is appropriate for his/her specific situation. Knowledge is most valuable when it is first needed - it should be made available as soon as possible. The quality of knowledge will improve with re-use and maintenance.

2.2.5 Increase knowledge access

Limits must be assigned so that not everyone who accesses the knowledgebase system will be able to see everything or have updating capability. The organizations that have been successful with Knowledge Management link analyst rights and privileges to their demonstrated knowledge competency. Knowledge competency management is part of the performance assessment processes.

Expanding access to knowledge involves migrating access to content to new audiences based on demand and/or an analyst's judgement, and the random sampling and scoring of solutions in the knowledgebase. Generally, when a solution is first created it is only visible to a small audience. For example, if a Level 2 analyst creates a solution, that solution is immediately visible and searchable by other Level 2 analysts. If the solution is re-used by a peer and reviewed for correctness, it could then be flagged as a candidate to be made available to the Level 1 analyst. Through knowledge use, review and availability, solutions are constantly migrated closer and closer to the customer, based on demand.

2.2.6 Performance assessment programs

The organization must facilitate and encourage participation in the processes of knowledge creation and use; it must also recognize and reward those who create value. Most organizations

find that they must shift performance assessment practices from individual and activity focused measurements to team and value-creation measurements. For example, knowledge may be created and added to the database, but it may not be correct, useful or searchable. The focus should be on the results of additions to the knowledgebase. Reward those who build and maintain knowledge that is re-used and rated useful by those who access it.

2.3 The role of the Support Center in Knowledge Centered Support

Knowledge Centered Support cannot be implemented and maintained without contribution from the overall Support Center organization; key roles have been identified in Figure 2.2 below.

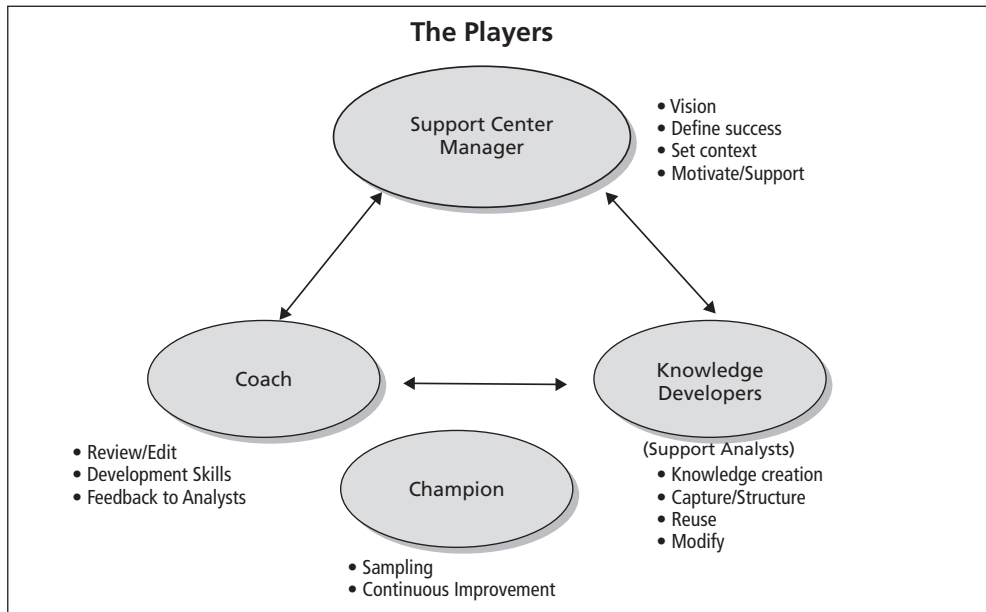


Figure 2.2 Key roles

2.3.1 Key roles

Support Center Manager

The Support Center must lead the effort by clarifying the vision and goals, as well as defining what success looks like. They need to direct their team in deciding how the work should be done (workflow) and the standards for creating findable and usable solutions (content standard).

Knowledge Developers

KCS I (front line support analyst) - basic user of the knowledgebase, familiar with searching techniques, the basic concepts of Knowledge Centered Support (KCS), and able to frame questions/solutions. All initial framing work done by a KCS I will be reviewed by the KCS Coach before release for others to view.

KCS II (more experienced front line support analyst) - has sufficient experience in creating and modifying knowledge to enable the coach to review only part of his/her work before making the knowledge available to others. The proportion of review decreases as the analyst become more experienced and as the knowledge created improves.

KCS Coach

This role is likely to be a senior or lead analyst. In larger organizations this may be a dedicated position. The KCS coach reviews 100% of the work done by a KCS I and only part of the work done by a KCS II analyst.

KCS Champion

This role is responsible for monitoring and sampling of the knowledgebase. The KCS Champion looks after the health of the knowledgebase and usually focuses on a collection or domain of content. This role requires technical expertise in the domain and profound understanding of KCS processes. The KCS Champion has responsibility for recognizing those who contribute well to the knowledgebase and those who need further training. The KCS Champion is the quality monitor for knowledge. This may be a dedicated position in a large organization or it might be part of the responsibility for a support manager, supervisor or team leader.

The KCS Champion should involve the entire organization from time to time in a continuous improvement process for Knowledge Management. The results of organizational involvement efforts lead to process improvements, creation of internal knowledge standards and development of reward and recognition programs.

2.3.2 Helpful hints for implementation, ongoing operations and optimization of Knowledge Management

- Aim for cultural acceptance - the organization needs to fully recognize knowledge and information as a key asset to be managed, fully exploited, and capable of generating significant returns.
- Reject the 'knowledge is power' theory. Sharing knowledge empowers everyone in the support organization to act as ambassadors.
- Collect and store information only once whenever possible. Use it often.
- Recognize that information assets under control in a Knowledge Management environment contribute to regulatory compliance as well as to organizational efficiency.
- Store information so that it can be linked, processed, properly maintained and presented to different audiences.
- Recognize the need to manage knowledge and its availability within the constraints of commercially sensitive information.
- Make use of appropriate infrastructure, tools and processes to support knowledge and information management initiatives.
- Make continuous improvements where necessary to avoid stagnation.
- KCS is not something we do in addition to solving problems; it becomes the way we solve problems.
- KCS is a team activity and the organization must achieve a balance between individual measures and team measures.

2.4 Measurement and reporting

Recommended reports for Knowledge Management are as follows.

Leading indicators (activities) should be tracked as trends. Do not put goals or objectives on activities; experience has shown that this will corrupt the knowledge base. Leading indicators include:

- analyst usage of knowledgebase - how many times the system is used in comparison to the number of incidents handled
- knowledge use/reuse - knowledge used to solve incidents reported by analyst(s) responsible for building or modifying the knowledge
- authoring - new solutions/pieces of knowledge added to the knowledgebase. Metrics should be broken down by analyst, by team and by knowledge category
- use of system/per call - to show the number of times analysts and end-users access the database
- knowledge re-use - use of specific solutions or knowledge by analysts and end-users
- amount of knowledge/number of solutions - size of knowledgebase and the number of items of content in the knowledgebase
- solutions per analyst/team – number and quantity of information added to the database per analyst and per team

Outcomes (results or goals - team objectives):

- quality control - knowledge rating scores by end-users and customers
- customer satisfaction - qualitative and quantitative surveys of end-users and the analysts who write and review knowledge
- time to publish/complete quality control process - length of time between the close of incident and time to access by end-users
- overall percentage of problems resolved by knowledgebase
- average handling time - benchmarked before implementation and then periodically measured as use and acceptance increases (a word of caution here: if you are delivering knowledge to the end user for self-help the average handle time will go up in the support center)
- customer satisfaction - satisfaction rates for all audiences (analysts and end-users) - that access and use the knowledgebase.
- customer success on the web – the percentage of times the customer goes to the web first and the percentage of time the customer finds what they are looking for.

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Chapter 3:

Configuration Management

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3.1 Overview

3.1.1 Description

The goal of Configuration Management is to maintain control of the IT infrastructure. Configuration Management ensures that only authorized IT assets are used; detailed information about these assets is kept up-to-date in the Configuration Management Database (CMDB) to support the effectiveness of other IT Service Management processes. From the Support Center perspective, the information stored in the CMDB provides invaluable information to enable the Support Center staff to:

- quickly isolate, diagnose and restore incidents
- assess the impact of a failed infrastructure component to the end-users' community
- provide information at their fingertips to quickly address end-user's queries
- enable planning and execution of service requests.

The term *Configuration Management* is often mistakenly used, interchangeably, with Asset Management and Inventory Management. Although these three processes may share the same repository or have common overlapping information, they are distinct processes with different scope and objectives.

Configuration Management is concerned with the identification, definition and ongoing verification of the accuracy of IT assets, their relationships to each other and to the IT systems and services. Inventory Management provides limited information to manage change and aid in problem isolation for a particular IT asset. Configuration Management combined with Inventory Management provides a wealth of information to support the management of all IT Service Management processes. The scope of IT assets under the control of Configuration Management is often a subset of Inventory Management.

Inventory Management deals with the identification and tracking of IT assets for the purpose of knowing its location, quantity, owner and key physical characteristics such as device configuration (for hardware devices) or version number (for software or documentation).

Asset Management is focused on the financial aspects of an IT asset. Information related to cost, depreciation, ownership, lease and contract management are some of the key characteristics of an IT asset that are managed by this process. In terms of scope, the Asset Management process may not track every asset under the control of the Inventory Management process. For example, the Asset Management process may manage only IT assets that are above a certain financial value.

3.1.2 Key definitions

Configuration Item (CI) is an IT asset that is under the management of the Configuration Management process. *A CI can be a physical IT asset or a logical representation of an IT asset.* For example, a physical CI is typically hardware (i.e. server, network devices, disk array), software (i.e. third party package or in-house developed application), document (i.e. technical document, contract, license) or a database instance. Examples of a logical CI can be an IT service, a system or a grouping of physical CIs such as a server cluster or virtual machine.

Attributes are specific information about a CI that provides more detail of its identity, configuration or other special characteristics. For example, serial number, model number, number of CPU, amount of memory and IP address are just some of the attributes of a server. Relationships are the associations or connections between two or more CIs. They provide information on how the CIs are related to or dependent upon each other. Attributes of a relationship may define whether the association is a parent-child type or a peer-to-peer type. An example of a relationship is 'Runs On', which is used to associate a software CI with a hardware CI. Another example is the use of a relationship 'Connected To', which is used to associate a hardware CI with another hardware CI. For more examples of CI relationships, refer to the illustration in Annex A3.5.

Configuration Management Database (CMDB) is the repository that stores all the CIs, their attributes and their relationships. A CMDB can comprise one or more physical databases.

3.1.3 Relationships to other processes

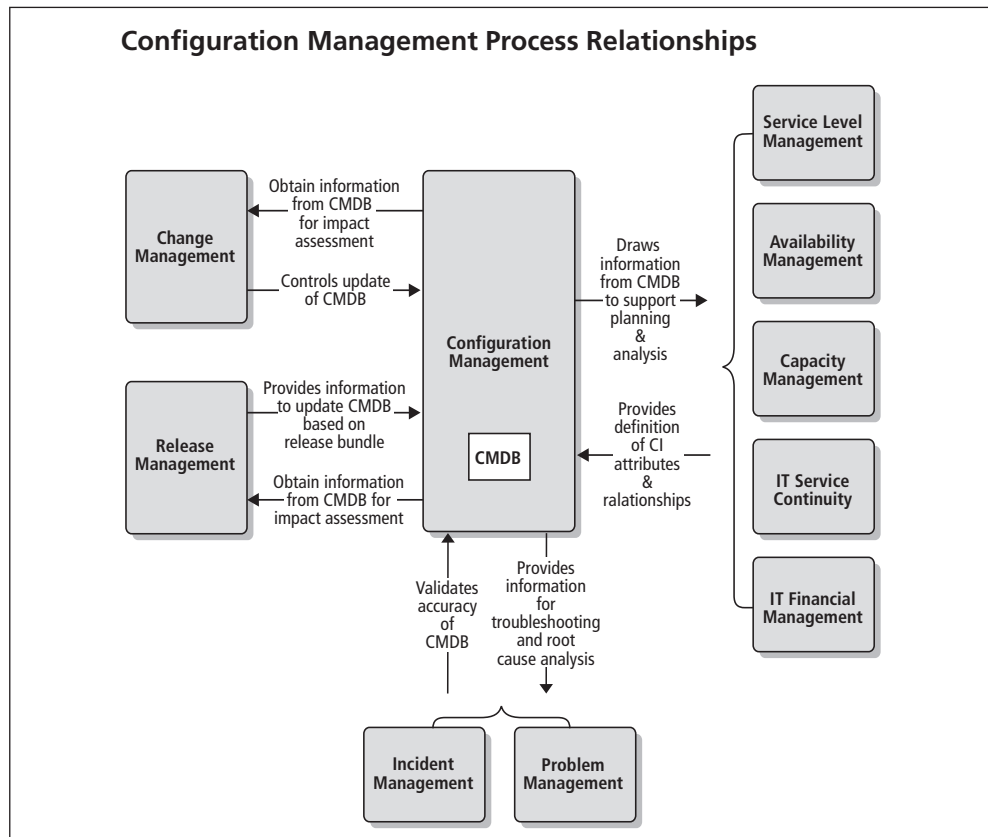


Figure 3.1 Relationship to other processes

3.1.4 Key inputs and outputs to the process

Source/ Destination	INPUT TO Configuration Management		OUTPUT FROM Configuration Management	
	Importance	Description	Importance	Description
Incident Management	High	<ul style="list-style-type: none"> Validates CI information 	High	<ul style="list-style-type: none"> Provides CI attributes and dependency information for impact analysis of failed CI and for aiding incident recovery. Provides end-users' profile information and hardware and software used by them. Provides historic information related to CI such as recent changes, repairs etc.
Problem Management	Medium	<ul style="list-style-type: none"> Validates CI information 	High	<ul style="list-style-type: none"> Provides historic information related to CI incidents, changes, known errors etc. Provides CI dependency information between CIs for root cause analysis.
Change Management	High	<ul style="list-style-type: none"> Validates CI information Controls updates to CMDB 	High	<ul style="list-style-type: none"> Provides CI dependency information to assess potential impact of change. Provides CI baseline information to aid 'fallback' of failed changes. Provides historic information related to CI such as recent changes, repairs etc.
Release Management	High	<ul style="list-style-type: none"> Triggers updates to CMDB for CI status, CI attributes and relationships. Triggers creation of new configuration baseline in CMDB. Triggers creation of new CIs and all associated attributes and dependencies in CMDB. 	High	<ul style="list-style-type: none"> Provides CI attributes and dependency information for impact analysis to prepare for testing and release rollout. Provides historical information related to CI incidents, problems and known errors for bug fixes.

Service Level Management	High	<ul style="list-style-type: none"> • Triggers creation of Service CIs and their relationships between system CIs and the customers who use them. • Triggers creation of CI attributes to be used for Service Catalogue creation. • Stores SLA documents. 	High	<ul style="list-style-type: none"> • Provides information to aid SLA creation by identifying critical CIs that are used for measurement of Service Level. • Provides information related to incidents, problems and changes for Service Performance reviews and Service Delivery reports.
Capacity Management	Medium	<ul style="list-style-type: none"> • Stores capacity plans. • Triggers creation of CI attributes (i.e. threshold, weighting factors and coefficients for mathematical formulae) to be used for modeling and forecasting capacity growth. 	Medium	<ul style="list-style-type: none"> • Provides CI dependency information for end-to-end planning, analysis and monitoring of capacity utilization and performance of services and systems.
Availability Management	Medium	<ul style="list-style-type: none"> • Triggers creation of CI attributes (i.e. weighting factors and coefficients for mathematical formulae) to be used for calculation of service and system availability. 	Medium	<ul style="list-style-type: none"> • CI baseline information and CI relationships to aid recovery of service and systems in the event of a disaster. • Provides information on reliability and maintainability of CIs based on incidents and changes.
Financial Management	Medium	<ul style="list-style-type: none"> • Aligns service CIs definition in CMDB with that of customer billing information. 	Medium	<ul style="list-style-type: none"> • Provides end-users' profile information and services used by them for billing and charge back.
IT Service Continuity Management	Medium	<ul style="list-style-type: none"> • Stores IT service continuity plans and test results from Service Recovery simulations. 	Medium	<ul style="list-style-type: none"> • Identifies CIs critical to IT Service continuity and provides information on CI dependency and CI configuration.

3.1.5 Possible problems and issues

Scope is too wide

The scope of the CI to be managed is too wide; significant resources are required to populate and maintain the CMDB.

Mitigation:

- Start small, phase in gradually. Criteria to select which services and systems to start the CMDB population can, for example, be dependent on any one of the following factors: criticality of the services and systems to the organization, amount of accurate inventory already at hand, most significant 'pain points', largest cost savings attainable.
- Integrate with auto discovery tools to obtain base inventory.
- Ensure the level of details captured in the definition of CI attributes and the relationships between CIs provides maximum control and benefits needed but at the same time minimizing the effort required to maintain them.

Wrong level of detail

The level of detail of CI attributes and relationships types is too little or too much to be useful to support groups.

Mitigation:

- Be realistic and clear on the goals for Configuration Management. Based on the goals, derive the requirements that will be used to design the CI object model. Since the object model is the source of reference when populating and updating the CMDB, it should encompass all the CI types, CI class, relationships and CI attributes, with appropriate level of details to meet the objectives of the established goals.
- Involve the support groups in the requirements gathering and development phases of the CI object model design. They are the subject matter experts for their respective technology domains (i.e. network, servers, application, database, etc).

'Bottleneck' perception

The Configuration Management group is seen as a bottleneck.

Mitigation:

- A central and dedicated group to update and maintain the CMDB should facilitate better quality of data and ensure a higher degree of process compliance. However, too much centralization leads can lead to a bottleneck if the group is not resourced properly. Conversely, if the update of the CMDB is distributed to each functional group the quality of data and process compliance may not be up to standard. The decision to centralize or decentralize depends on the volume of CMDB updates and the ability of the central group to know what changes are made in the environment. One approach that combines the best of both worlds is to distribute the updates of the CI to the individual support groups, but have a central group to oversee the governance of the CMDB updates. This central group can be responsible for audits and validation of the CMDB to ensure compliance by the rest of the support groups.

Burden of audit

Audit of the CMDB is too time consuming and resource intensive.

Mitigation:

- Employ the use of auto discovery tools to validate what has changed in the IT infrastructure against what is entered or updated in the CMDB.
- Audit of the CMDB can be approached in one of two ways:
- perform audits with smaller sample size but more frequently
- conduct audits with larger sample size but less frequently.

Inability to track changes

Changes to the CMDB cannot be tracked.

Mitigation:

- Ensure the IT service management tool that houses the CMDB repository has the capabilities to capture audit trails of CI updates. Most tools can track the creation and deletion of CIs but few have the capability to track specific changes made to the CI attributes. Modify existing tool or look for tools that have the additional functionality.
- Ensure the tool has the capability to provide role based security so that appropriate detail of access level can be defined for different job functions.

Responsibilities unclear

Configuration Management responsibilities are not clearly defined and understood.

Mitigation:

- When designing the Configuration Management process flow, ensure the process activities are defined in sufficient detail to enable delineation of responsibilities between various organizational groups or individuals.
- Use ARCI matrix (Accountable; Responsible; Consult; Inform) to map each process activity to individuals or group. Refer to Annex A3.6 for ARCI template and example.
- Provide ongoing training to all staff including management. Training should incorporate various forums and media. For example, a training program may start with formal classroom sessions, then follow with on-the-job coaching by Subject Matter Experts (SMEs) for several weeks after the initial rollout. After the 'settling' period, certain aspects of the tools or process activities may still be unclear or incorrectly used. To remedy these problematic areas, 'lunch and learn' sessions, newsletters or smaller training classes may be incorporated to target the individuals who still require further education.
- It is also possible that the process may require adjustments or corrections to address areas of confusion. Avoid the temptation to change the newly deployed process until after the 'settling' period. This period may take three to six months depending on the size of the organization.

Information not being exploited

Support staff do not exploit the information captured in the CMDB to support other Service Management processes.

Mitigation:

- Provide training, both formal and informal, to ensure that support staff understand the data model of the CI relationships, the types of attributes captured for each type of CI class and CI type and the capabilities of the service management tool.
- Ensure the service management tool has capabilities to quickly extract the required information and present them in a relevant format. For example, it is easier to understand the relationships between CIs when presented in a graphical format than in a text report.
- Change the mindset of the staff from reactive management of the IT infrastructure to a service based proactive one.

3.1.6 Quality issues

CI information is not up to date

CI information in CMDB does not reflect real configuration; CIs are missing or out of date.

Mitigation:

- Change Management, Release Management and Asset Management processes need to be in place and closely integrated with the Configuration Management process. Process activities that trigger an update to the CMDB must be clearly identified with established accountability and responsibilities.
- Increase audits to validate changes. Use discovery tools to compare CI configuration and relationships in the real world to that of the CMDB.

Inconsistent CI entries

CI entries are not consistent or partially filled.

Mitigation:

- Enforce standardization via tool functions - pick list, mandatory fields.
- Establish naming convention policies and ensure that these policies have management support.
- Determine if further education is required.

3.1.7 Security issues

Unauthorized access

Unauthorized access or updates are made to the CMDB.

Mitigation:

- CMDB data needs to be carefully classified to allow proper segregation of duties. For example, CIs managed or supported by one group may be restricted to READ ONLY for another support group. Some CIs may contain confidential information that may only be viewed by authorized personnel. Establish policies to define what is to be entered into the CMDB, who should have authorization to access the data and what level of access is permitted.
- Ensure the Service Management Tool that stores the CMDB has the functionality to control the access and updates of CIs at the appropriate security level required.

Changes cannot be traced

Changes made to the CMDB are not traceable.

Mitigation:

- Determine what data element of the CI is to be audited, then ensure the Configuration Management tool has the capability to record audit trails at the level of detail required.
- Ensure data backup policies are established and that the CMDB is backed up on a regular basis to enable recovery of deleted CIs to trace their history.

Sensitive data

Sensitive data is not protected.

Mitigation:

- Establish policies to define what type of sensitive data should not be recorded in the CMDB. For data that is deemed to be confidential, ensure that a proper level of control is defined and implemented in the Configuration Management tool.

3.2 Implementation

3.2.1 The implementation process

There are three major streams of activities involved in the implementation of Configuration Management: process design; tool selection, design and implementation; and configuration structure design and CMDB population. Throughout the implementation process, it is crucial that a robust communication plan is maintained to keep the organization informed, motivated and engaged. Figure 3.2 shows the major grouping of activities necessary for implementation. Although most of the activities between the three streams can be performed independently or in parallel to each other, there are some activities that cannot be done until one or more activities from another stream have been completed. For example, gathering of tool requirements cannot be completed until high-level process design and the configuration structure model and its attributes are defined.

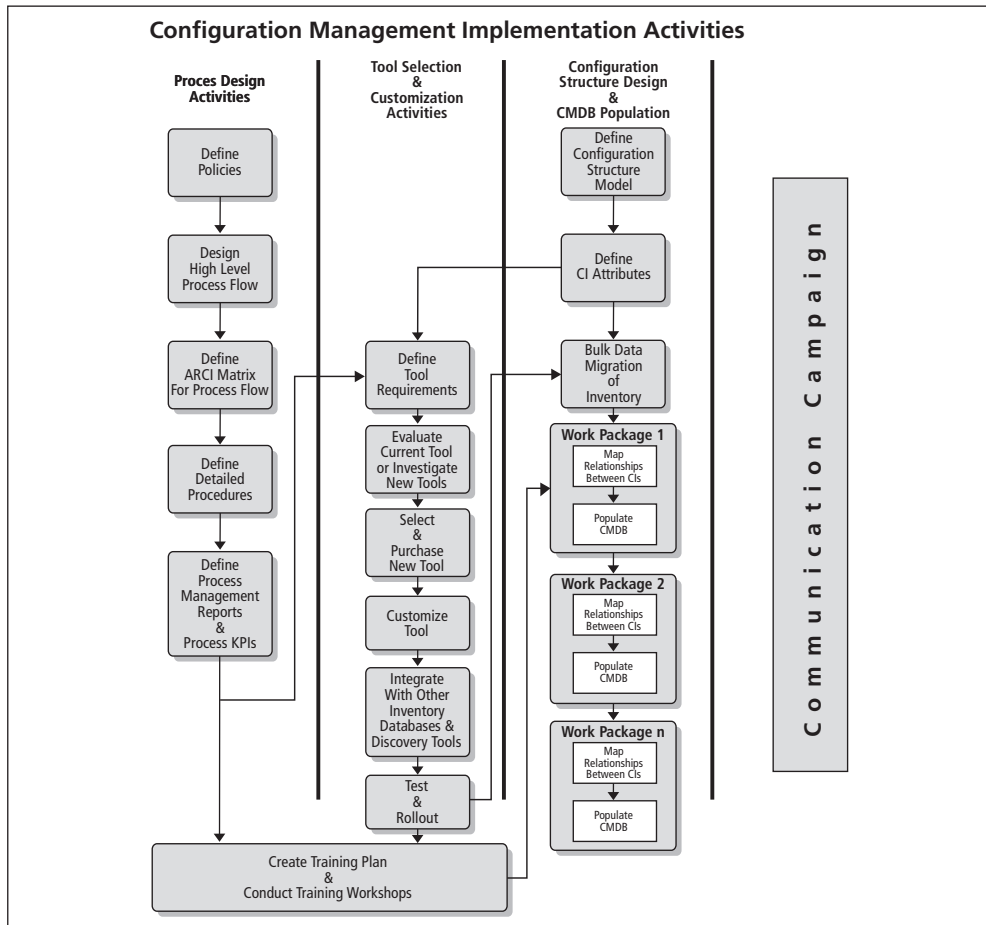


Figure 3.2 Configuration Management implementation process

3.2.2 Support Center Manager's role

Responsibilities and activities

The Support Center Manager plays a key role in the implementation of the Configuration Management. Since he/she is the link between the Configuration Management project team, the Support Center staff and the end-user community, this individual will be liaising between the three parties throughout the implementation phase to ensure the needs of all parties are addressed in a timely and effective manner:

- providing information on current process by detailing what works well and what does not
- providing input into the design of the new policy, process, ARCI matrix and the procedures, from Support Center perspective, and reviewing them for sign-off
- providing input to the tool requirements, from Support Center perspective, and sign off the requirements document
- providing input to the design of the configuration structure model and the attributes of CIs that are managed by the Support Center

- working with the project team to develop a Configuration Management plan that describes the services, systems and CIs that will be populated in the CMDB for work package 1, 2, 3 and so on
- communicating to the customers and Support Center staff the goals and benefits of Configuration Management, together with the project milestones; keeping them up to date with the progress of the project
- explaining to the customers and Support Center staff the differences they will encounter when they interact with the Support Center once the project is rolled out
- jointly developing a training plan with the project team to ensure Support Center staff are well trained in the new process, the configuration structure model and the use of the tool
- jointly deciding with the project team the rollout date, ensuring minimal impact to the end-user community and the Support Center staff
- jointly working with the project team to estimate resource requirements in terms of staff, hardware and software costs for the implementation and ongoing support of Configuration Management
- coordinating between the project team and the Support Center Manager's staff to gather hardware and software inventory managed by the Support Center; establishing relevant relationships between them for CMDB population
- coordinating between the project team and end-users to gather information about end-user profiles for CMDB population.

Deliverables

- Before the start of the project, providing any policies, process or procedures currently in use by the Service Center to manage the inventory and configuration of the services and systems they support
- Business and technical requirements for the development of the new policies, process, procedures and the Configuration Management tool, respectively
- List of inventories managed by the Service Center before start of project
- List of inventories to be managed for the implementation of the project and ongoing operations
- List of end-users and their profiles along with their hardware, software and license usage
- Requirements for training of Support Center staff for the use of the new process and tool

Requirements for management reporting and KPIs

For budget planning: requirements for extra staff for the project and for ongoing support, cost of new hardware and software licenses for the use of Configuration Management tools

Competencies

- Achievement orientation
- Influence and impact
- Team leadership
- Negotiation skills
- Listening and communication skills
- Customer service orientation
- Information seeking
- Organizational awareness

Key performance indicators (KPIs)

One of the key success factors for implementing any new process is that the implementation is conducted as a formal project, following best practice project management methodology. Many of the key performance indicators for implementation are based on the following milestones:

- sign-off for project charter and project timeline
- sign-off for new policies, process and procedures
- sign-off for business requirements document for Configuration Management tool
- sign-off for test cases and test results for tool testing
- sign-off for implementation and rollout plan
- sign-off for implementation.

3.2.3 Support Center Function's role

Responsibilities and activities

The role of the Support Center is to assist the Support Center Manager to obtain his/her deliverables. Some information will rely on the Support Center's staff experiences while others will rely on data obtained from historical management information and KPI reports produced by the Support Center. For example, CIs will need to be prioritized for population in the CMDB. Criteria could be based on systems that historically took too long to fix due to unavailability of CI configuration or due to improper identification of CIs; the Service Desk might have reports that show the trends in resolution time by CI type.

Deliverables

In addition to the deliverables provided by the Service Support Manager, the following additional deliverables should be provided by the Support Center staff:

- reports that classify incidents by CI class and CI type
- reports of incidents caused by wrongly made changes
- undocumented information or knowledge about various CI relationships accumulated by Support Center's staff over time as they learn from their troubleshooting experiences

Competencies required

- Achievement orientation
- Teamwork skills
- Listening and communication skills
- Customer service orientation
- Information seeking
- Analytical thinking
- Technical knowledge
- Technical documentation skills
- Multi-task thinking and execution skills

KPIs

Percentage completion of the deliverables as described in the Support Center Manager section.

3.2.4 Other key roles and functions in the implementation process

Executive sponsor - responsible for providing organizational leadership, guidance, advocacy and financial funding for the Configuration Management project.

Project manager - accountable for timely completion and budget spending of the Configuration Management project. He/she is responsible for developing project plans and managing all activities for the Configuration Management project and related communication and awareness campaigns.

Configuration Management process owner - accountable for the design and development of the Configuration Management process. Through leadership and influencing skills, he/she ensures that a unified process is developed across the entire organization by being an advocate and champion of the Configuration Management process.

Data model architect - responsible for defining the object model that shows the entity relationship diagram(s) of all possible CIs and their relationships to each other.

Business analyst - responsible for gathering and documenting all business and functional requirements for the customization of the Configuration Management tool. He/she will also be responsible for developing and documenting the test plans and test cases for the tool.

Technical specialist(s) for Configuration Management tool - responsible for the customization of the Configuration Management tool, based on business and functional requirement documents, through programming or tool setup and administration. In addition, bulk data loading activities to prepare CI inventory data from various sources for import into the Configuration Management tool will require technical expertise.

Process advisor/consultant - as subject matter expert on the ITIL framework, this role provides advice on process engineering methodology and best practices on Configuration Management. Facilitates meetings during design sessions for policies, process and procedures.

Configuration Manager - participates in design sessions for policy, process and procedures; assists data model architect in defining CIs and their relationships; also defines CI attributes for the CIs supported by his/her group. Collection of CI inventory for initial bulk data load to populate the CMDB will also be part of the responsibility of the Configuration Manager. For a small organization, one Configuration Manager may represent several technology support groups (i.e. UNIX Systems Administrators, Database Administrator, Desktop Support Analyst, Network Support Analyst, etc). For a large organization, each group may have their own Configuration Manager.

Process analyst - responsible for documenting all policies, process, procedures, process management reports and KPIs based on input from design sessions and from consultation with process advisor/consultant and Technology Support Group Representatives.

3.2.5 Planning for implementation

Steps to take

- Secure the executive management sponsor. The role of the executive sponsor is to ensure that adequate funding is available for the project and to provide leadership and support for this initiative. The executive may lead the project steering committee or appoint one of his/her senior managers.
- Form core project team. The core team should include a project manager, the Configuration Management process owner and process managers representing key functional or organizational groups.
- Define project scope, goals and objectives.
- Establish a communication plan to keep the organization informed throughout the project and also prepare them for the rollout.
- Perform 'as-is' assessment of current process, tools and CI information already captured in the organization. Depending on the availability of internal resources to perform this assessment, it may be necessary to hire external consultants to perform the assessment so as not to take the core team away from their existing responsibilities.
- Develop implementation approach and Configuration Management plans. Priorities and details of the deliverables and resource requirements can be established, based on the analysis of the 'as-is' assessment report. Very often, due to the large number of CIs involved, a phased approach will be adopted to implement this process. Several options and considerations for phasing the population of the CMDB are listed in the section 'Necessary Information and Data' below.

Groups to contact

- Service Desk
- Problem Management Group
- Change Management Group
- Release Management Group
- Availability Management Group
- Technical Support groups such as Network Management, Server Administration, Database Management, Desktop Support, etc.
- Application Development group
- Service Level Management individuals or groups such as Account or Relationship Manager

Necessary resources and relationships

As shown in Figure 3.2, the implementation of Configuration Management encompasses three streams of activities:

- Process Design
- Configuration Management tool selection and customization
- Configuration Structure modeling and CMDB population.

During the process design phase, a design team consisting of the Configuration Management process owner, Configuration Managers, process advisor/consultant and process analyst will be working together. They develop the policies, high-level process flow, detailed procedures, process management metrics and KPI report requirements.

The effort and resources required to customize the Configuration Management tool depend on whether the tool is already in use or if a completely new tool is to be purchased. At a minimum, a core team consisting of process advisor, business analyst and technical specialist for the tool is required to gather tool requirements, develop and customize and test the tool. Input from various Configuration Managers and a data model architect will be required during the requirements gathering phase of the tool.

The design of the Configuration Structure and the definition of the CI and relationship will be done primarily by the data model architect, with input from the Configuration Managers and process advisor.

Initial population of the CMDB can be achieved by performing bulk data load, provided that a standard format and interfaces have been developed and designed by the technical specialist. These enable the Configuration Management tool to accept data from various sources such as spreadsheets, databases or system discovery tools.

Necessary information and data

Most information and data necessary for the implementation of Configuration Management can be identified during the 'as-is' assessment. The data gathered will provide valuable information to determine the approach, scope and resource requirements for implementation. The assessment template should be completed by each of the above groups listed in the 'Groups to Contact' section. Refer to Annexes A3.3 and A3.4 for examples of 'as-is' assessment templates.

List of inventories and repositories (i.e. hardware, shrink wrap software, in-house developed applications, documentation, end-user list, databases, etc) maintained by various support groups. In addition to inventories of various CI types, the attributes captured for each CI type need to be gathered. This information will be used to gauge how complete and accurate the inventories are compared to what is actually deployed. It will also provide insight into which groupings of assets are better managed and how the attributes for each CI types are currently being used.

Policies, process and procedures currently in use for Inventory Management, Asset Management, Change Management and Release Management. This information will be used to establish integration points with the new Configuration Management process and determine new policies.

Systems architecture diagrams and technical documentation of systems that will be managed under the new Configuration Management process. This information will be used to define the relationships between CIs in the future CMDB.

In addition to the technical assessments, there will need to be an assessment of the skill sets within the organization in the areas of process design, data modeling and specific knowledge related to Configuration Management. Based on the information gathered, it may be necessary to hire external consultants to conduct training or even to be involved with the project team.

As mentioned earlier, the population of the CIs and their relationships into the CMDB will usually be phased in over time. The larger the organization, the longer the data gathering and population period will be. A number of criteria can be used to aid in the prioritization of CIs and their associations for CMDB population. The criteria could be based on criticality of the systems/services to the business, outsourcing or insourcing projects, systems/services causing the most difficulties to support due to lack of CI information, projects that require CI information such as technology refreshment, total cost of ownership etc. Depending on the chosen criteria, historical statistics and management information captured by the Service Desk, Incident Management, Change Management, Problem Management, Release Management and Availability Management processes can provide further data for decision making.

Measurements that should be in place

Completeness and approval of Project Charter, which defines such aspects as project scope, goals, funding and resource requirements.

The accuracy and completeness of the 'as-is' assessment templates to be filled by various support groups.

Completeness and details of project plan.

3.2.6 Implementing key process activities: hints and tips

What to implement first

Before attempting to implement any of the Configuration Management activities, the organization must ensure that the Change Management process has been implemented and operated at a mature level. Without a well-established Change Management process, the integrity of the CMDB cannot be maintained.

If inventories of CIs are absent, start the population of the CMDB with inventory of CIs and their attributes. CIs that are in data centers should be targeted first since these are usually better managed than those that are dispersed in end-user areas (i.e. Desktop CIs).

Things that always work

Keep design team small but conduct periodic 'walk throughs' with larger groups. A small design team will reach consensus faster, while conducting 'walk through' with larger audiences will ensure the rest of the organization does not feel alienated.

Set up a project team and apply project management methodology to ensure that dedicated resources and time are allocated. Risk of failure or prolonged implementation is high without these in place.

Ensure training is provided to the people who will be involved with the Configuration Management process. Training courses should be tailored to the various roles of the Configuration Management process to ensure the right level of detail is provided to the right people. For example, a Configuration Coordinator will receive different training from a person who is at the Service Desk. Training should be given as close to the rollout date as possible. Ensure an adequate coaching period is formally established immediately after rollout date to 'handhold' people.

Little things that deliver big returns

Senior management should communicate the vision and goals of Configuration Management to the rest of the organization at the onset of the project. One or more senior managers should also be part of the project steering committee team that meets on a regular basis to provide leadership, guidance and support to the project team throughout the life of the project.

A communication strategy should be developed to provide periodic updates to the rest of the organization throughout the life of the project. This will ease the acceptance of the new process and tool(s) when they are implemented.

Information about the dependencies between CIs may not be documented completely, nor reside in one source. The information might be in people's head across multiple groups and in various technical documents. An interview approach will need to be adopted. Recording of the CI relationships is more effective when captured on paper first, in their entirety, before capturing them in the CMDB.

When implementing a new CMDB, existing data stored on various repositories will probably be imported into the new CMDB. The data migration process and data conversion tool need to be carefully planned, designed and tested in great details. Do not underestimate the effort required to perform these activities.

The data migration process may require data preparation or 'cleanup'. If the time required to perform this activity is more than a few days, a strategy should be developed to track the changes made to the infrastructure while the data in the repository is frozen from any changes during this data 'cleanup' period.

The initial phase of the CMDB population might only focus on a subset of the CIs. However, when defining the Configuration Structure object model, consideration should be given to include all the CIs in the entire IT infrastructure.

The concept of establishing relationships between CIs will be new to most people. A 'Quick Reference Guide' booklet detailing all possible CI associations will facilitate better conformance to the defined standards.

Little things that always get forgotten

Provide training for the project team at the initial onset of the project to ensure all team members understand the basics of Configuration Management and process design methodology.

Archival strategy for CMDB data is usually forgotten or only considered when disk space for CMDB database is close to reaching maximum capacity. The archival of CMDB data should be carefully planned during the design of the CMDB.

3.2.7 Key process activities

As shown in Figure 3.2, the implementation activities consist of three streams of activities: process design, tool selection and implementation, and configuration structure design and CMDB population. A brief description of each set of activities is provided below.

Process design activities

Define policies: the policy document should include: scope of coverage of the CMDB; CI creation, update, disposal and status accounting policy; frequency of audits; and naming conventions for CIs.

Design high level process flow: all major process activities for CI identification, creation, updates and disposal should be detailed in a high level process flow. Activities for planning, audit and validation should also be included along with integration points with other processes such as change and release management.

Define ARCI matrix for process flow: once all the activities in the high level process flow are defined, the people or organization group(s) who are Accountable (A), Responsible (R), Consulted (C) and Informed (I) in the execution of these activities should be detailed in the ARCI matrix.

Define detailed procedures: the detailed procedure provides more specific information regarding how and when the activities (as defined in the high level flow and the ARCI matrix) are to be executed. Note: the procedure may contain information about process activities specific to tool functionality, but it is not meant to be work instructions or tool end-user guide.

Define process management reports and process KPIs: requirements and definition of all process reports and Key Performance Indicators necessary to monitor and manage the process are defined. The title and purpose of the reports, distribution audience and publication frequency are documented here.

Tool selection activities

Define tool requirements: when considering a new tool or customizing the existing tools, consider the following key tool requirements: alignment of the tool functionalities to perform key functions of Configuration Management as defined by ITIL; integration with other Service Management tools that capture information for Incident, Problem, Change and Release Management; capability to interface with system discovery tools or software delivery/installation tools; security and audit features; and scalability to accommodate growth in CI and in end-user groups.

Evaluate current tool or investigate new tools: too often organizations may be reluctant to make an objective investigation of new tools if there is already one in-house. Although some savings can be gained in the short term to keep the existing tool, the long term cost or lost opportunity associated with choosing to stay with an inadequate tool could be quite substantial.

Select and purchase tool (if necessary)

Customize tool: depending on the extent and complexity of the tool customization needed to meet the stated requirements, it may be necessary to involve the tool vendor to perform the customization. The expense for this specialized resource can be substantial. When planning for the project budget at the beginning of the project, allow sufficient funding to accommodate this possibility.

Integration with other inventory database and discovery tools: some organizations may choose to perform this step after the Configuration Management project goes live. However, if the number of CIs is high and dispersed across multiple geographic regions, it is advisable to include this step as part of the project rollout. The automated discovery tools should be integrated with the CMDB. If they are not, the initial CMDB population, and then the validation and audit of CIs (once the process is in operation) in the real world compared to that of the CMDB will become too manual-intensive or unfeasible.

Test and rollout: to ensure thoroughness in testing of the tool, test cases should be documented and signed off by stakeholders. Testing should be staged in a manner consistent with the Software Development Life Cycle (SDLC), which incorporates functional, regression, system integration, end-user acceptance tests (UAT) and post deployment tests. Depending on the size of the end-user base, training and implementation of the new tool may be staged over several weeks or months so as to minimize disruption to existing operations and requirements for training facilities and trainers. After the tool is rolled out, it is important to have post implementation support from Configuration Management Subject Matter Experts (SMEs) who are readily available and accessible to address any issues or questions from the end-users of the tools.

Configuration Structure Design and CMDB population

Define configuration structure model: when designing the configuration structure model, all IT CI types and their relationships types should be included in the design even though the scope of the current Configuration Management project may be limited to a subset of the available CI types. A consistent and cohesive framework can be defined by considering all CI types at the onset of the design stage. It is important to have a well-defined set of Configuration Management goals before the definition of the model. The level of detail and granularity of the model depends largely on the goals of configuration. It is best to enlist the help of a Data Model Architect to define the configuration model.

Define CI attributes: involve a representative from each technical support group to participate in the definition of the attributes for each CI type; this will avoid defining too many attributes that will not be filled in by the various technical support groups when the CMDB is rolled out. Again, the goals of Configuration Management should be referenced when defining these attributes to ensure that the right number and right kinds of attributes are defined.

Bulk data migration of inventory: various technical support groups will be keeping track of their own inventory in spreadsheets or databases. To populate the new CMDB efficiently and effectively, import utilities will need to be developed to automate the transfer of these existing inventories. Development and testing of the data import tools usually requires definition of intermediary mapping tables which requires iterative testing due to unpredictable variation in the uniformity of data. Depending on the consistency of the data, manual 'data scrubbing' may be necessary to correct the data that cannot be imported automatically. This process activity may take a considerable amount of time; do not underestimate the effort required.

Map relationships of CI and populate CMDB: in addition to the population of the physical CI inventories into the CMDB, logical CIs representing services and systems have to be defined in the CMDB before end-to-end CI relationships can be established to model a service in the CMDB. Establishing these CI relationships requires research into the system architectural design of the system and services. In some cases, up-to-date technical documentation is available to aid this effort. However, more often than not, little or no documentation is available. For the latter cases, a discovery process, in the form of interviews involving various technical support groups, will be required to gather the information necessary to map all required relationships between CIs. The mapping exercise is best done on paper until all relationships are determined. Once the completed picture of the end-to-end CI relationships is validated, the information is ready for input into the CMDB. Depending on the complexity of the service or system and number of relationship types defined to model the configuration structure, the mapping of CI relationships for a service or system can be a time consuming effort. A prioritization scheme will need to be developed for 'bundling' services and systems into work packages in order to manage the workload and allocate the resource more effectively.

Communication campaign

Implementation of the Configuration Management process will require involvement from most technical groups of an IT department. There must be a strong and highly visible communication campaign to provide information and encourage buy-in from all level of management and staff. This is essential to ensure full cooperation and participation from these groups and also prepare the rest of the organization for process rollout. A communication plan using a range of media, formats and channels of delivery should be developed to reach different audiences at different times throughout the life of the project.

3.3 Ongoing operation

The Support Center is one of the biggest end-users of the CMDB. It should work in close collaboration with the Configuration Management group to validate and audit CMDB accuracy and exceptions found. In addition, depending on the update policies of Configuration Management, the Support Center may also be responsible for updating and maintaining the currency of certain CI types in the CMDB.

3.3.1 Support Center Manager's role

Responsibilities and activities

- Continue to provide training to ensure Service Center staff is fully versed in using the Configuration Management tool and that they have a thorough understanding of how to use and interpret the relationships mapping between CIs for troubleshooting and impact analysis.
- Ensure sufficient resource is allocated for Configuration Management activities
- Review audit reports regularly to ensure that Support Center staff is updating CI attributes and their relationships when changes are made to the IT infrastructure
- Take corrective actions to address discrepancies found in audit reports
- Review process management reports to monitor compliance of Service Center staff in following the configuration process
- Ensure staff makes maximum use of the data stored in CMDB to make informed decisions when assessing impact for incidents, problems and change to the infrastructure and for analysis of service requests implementation
- For new systems and CI types under the control of the Support Center, provide guidance and review CI definition and relationships before population in the CMDB
- Assist the Configuration Manager in the definition and update of the Configuration Management plan by providing input and review
- Participate in process review initiatives to improve process
- Provide process management and KPI reports to senior management

Deliverables

- Training plan for staff
- Action plan to address discrepancies found in audit reports
- Configuration management plan for CIs under the control Service Center group
- Recommendations for continuous process improvements

Competencies required

- Influence and impact
- Team leadership
- Negotiation skills
- Listening and communication skills
- Information seeking

KPIs

- Percentage of CI types (under the control of Support Center) successfully audited
- Percentage of CI types recorded in the CMDB
- Improvement in incident resolution time for incidents that rely on configuration data
- Improvement in completion time of service requests that rely on configuration data
- All staff fully trained in Configuration Management process

3.3.2 Support Center Function's role

Responsibilities and activities

- Update or correct the CMDB as defined by Configuration Management policies and process.
- Make regular use of historic information in the CMDB to enable effective troubleshooting and timely addressing of service requests.
- Provide daily, weekly and monthly process management and KPI reports to Support Center Manager.
- Validate CMDB information about end-users and their associated CIs as part of the activities of recording end-user service calls.
- Perform a periodic 'bulk' audit of CMDB accuracy.

Deliverables

- Reports showing historic incidents related to CIs
- Listing of end-users and their associated CIs
- Reports showing compliance of CI updates
- Reports of CI updates performed by Support Center staff

Competencies required

- Attention to detail
- Customer service orientation
- Information seeking
- Achievement orientation

KPIs

Same as Support Center Manager's.

3.4 Optimization

3.4.1 The optimization process

According to ITIL, a process is operating at 'Optimized (CMM Level 5)' level when:

- the process enables alignment of business strategies and goals with that of IT
- the process is fully integrated into the culture of the organization
- the process is proactive and pre-emptive
- continuous improvement activities are established and operating as part of the process
- tools are designed to integrate with people, processes and technologies.

The process diagram in Figure 3.3 provides a high level view of the activities involved in the optimization process.

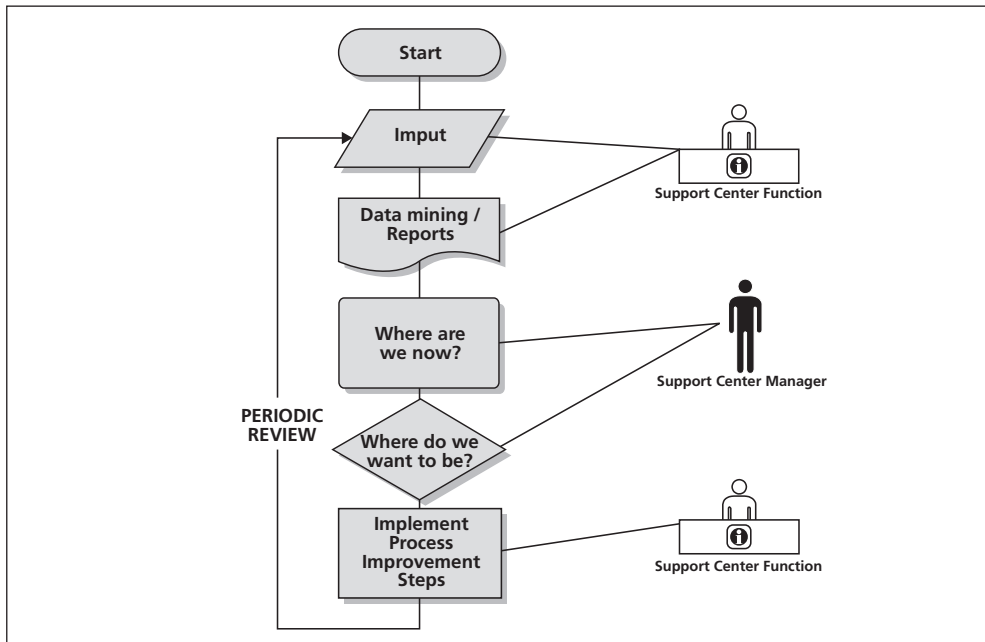


Figure 3.3 Optimization process

3.4.2 Support Center Manager's role

Responsibilities and activities

- Evaluate recommendations for process improvement from staff. Work with the Configuration Management process owner to make improvements.
- Evaluate recommendations for Configuration Management tools enhancement. Work with the technical specialist and Configuration Management process owner to make improvements.
- Identify opportunities to expand the use of the CMDB for capturing new CI attributes and relationships that could create value for the organization.
- Use information from the CMDB to support strategic planning (e.g. financial forecasting, technology refresh, new IT service development).
- Use information from the CMDB for service improvement initiatives (e.g. reduce cost related to the support of a troublesome application).
- Continue to champion the Configuration Management process and use of the tool to Support Center staff to embed a 'process-centric' mindset in the organization's culture.

Deliverables

- Continuous improvement plans
- New business and functional requirements for tool enhancements
- Reports to justify technology enhancement or new technology investments
- IT strategy plan that aligns with and supports the business plan

Competencies required

- Innovative thinking
- Strategic thinking
- Leadership
- Influence and impact
- Analytical thinking

KPIs

- Reduction in operating budget for the same number of IT services supported
- Increase in customer satisfaction score as measured by customer surveys not only in the areas of service delivery and in the planning and execution of activities to support business growth and transformation
- Improvement in quality targets

3.4.3 Support Center Function's role

Responsibilities and activities

- Identify inefficiencies in the process and propose recommendations for improvement to the Support Center Manager.
- Identify opportunities to improve the functionality of the Configuration Management tools to automate tasks for CMDB updates, reporting, validation or auditing.
- Work with customers and the Support Center Manager to design and implement new CI type templates in the Configuration Management tool; collect and populate data in the CMDB.
- Create reports for the Support Center Manager to support strategic planning and service improvement initiatives for the business.

Deliverables

- Business and functional requirements for tool enhancements
- Proposals for process improvement
- Reports of various kinds drawn from the CMDB to support Support Center Manager initiatives

Competencies required

- Innovative thinking
- Results-oriented
- Technical aptitude
- Customer service orientation

KPIs

Same as Support Center Manager

3.4.4 Future impact of this process on the Support Center

The relationships between business processes, services and IT infrastructure can be visually represented by integrating appropriate business service monitoring software tools with a well-managed CMDB. This capability enables the Support Center to monitor and respond to business relevant issues that are caused by IT infrastructure incidents. The ability to view business service alerts together with traditional IT system alerts provides the Service Center with more information to manage customers' service level targets and objectives more effectively.

3.5 Measurement, costing and management reporting

3.5.1 Implementing: benefits and costs

Why implement this process and what can be gained

Accurate accounting of the hardware, software, systems and service inventory and versions coupled with the maps of the relationships between physical CIs (i.e. hardware and software) and between these physical CIs to systems and services provides the following benefits:

- faster diagnosis and troubleshooting for incident recovery and root cause analysis for problem isolation.
- more accurate and timely information for planning activities; service/system availability calculation for Availability Management, risk analysis and contingency design for IT Service Continuity Management, performance and resource utilization analysis for Capacity Management.
- financial management process provides more accurate information for client billing.
- reduced cost of unused software licenses and avoidance of legal actions by third party software vendors due to over-usage of software.
- reduction in incidents caused by releases that used incorrect configuration data.
- reduced costs through taking opportunities for economies of scale in hardware purchase or lease renewal.

The above are just some of the many benefits attainable by the implementation of the Configuration Management process.

Cost elements for implementation

- Cost of hardware and software license for new tool
- Cost of technical consultant to implement and/or customize tool
- If an accurate inventory is not available, additional resources may be required for a short term to gather the inventory information for each type of CIs and input them into the CMDB
- Cost of temporary staff to substitute for full time staff who will be part of project team
- Cost of training staff before process rollout
- External Configuration Management process consultant

Making the business case to implement

Given the high number of virus attacks and security breaches occurring in the IT industry, it only takes one unmanaged and unaccounted PC to potentially bring down the entire business.

The cost of unproductive downtime due to this type of incident to the business is enough to justify the implementation of Configuration Management.

Management reporting

- Percentage of CIs, broken down by CI type, captured in the CMDB
- Percentage of services and systems with CI relationships established in the CMDB
- Percentage of CIs, broken down by CI type, with all their attributes fully defined in the CMDB

3.5.2 Ongoing operations

Cost elements for ongoing operations

- Maintenance cost of hardware and software license for new tool
- Cost of additional Configuration Management coordinator(s) and/or manager(s) to execute the process activities
- If system discovery tools are not integrated with the CMDB, additional temporary resources may need to be obtained to conduct a manual audit of CIs in the CMDB against CIs in actual used
- Cost of updating the process and procedures, based on periodic process review cycle, and retraining of staff based on new updates

Management reporting

- Percentage of CIs recorded in the CMDB that do not meet CI definition standards (i.e. naming convention)
- Percentage of changes implemented without updates made to the CMDB
- Percentage of CIs with association made to incident, problem and change as these events occur
- Number of CIs in various status categories
- Percentage of CIs with incorrect attributes or relationships

3.5.3 Optimization: benefits and costs

Why optimize this process and what can be gained?

Optimization of this process involves the efficient and effective execution of the process activities to ensure the CMDB is accurate and that the information captured in the CMDB is used to better align business and IT.

An up-to-date and accurate CMDB with all the necessary relationships established between service, systems and IT components puts the CMDB in a better position to provide the business with valuable information. For example, it is feasible to create business metrics and a service performance dashboard, with the right software tools, with data gathered from the underlining technology that allows customers to easily examine the impact of technical issues. When customers are presented with real-time information that they can understand, the business and its IT department can better manage and minimize impact of technology incidents, quickly divert resources to avert performance issues or simply display the status and health of the business service.

Cost elements for optimization

- Cost of new tools for real-time and proactive detection and reporting of alerts from the business service perspective
- Cost of resources to perform continuous improvement activities
- Cost of training

Management reporting

- Percentage of services with capabilities to display business metrics and dashboard
- Customer survey scores

3.5.4 Tools*Implementation*

During the implementation phase of Configuration Management, identification of CIs and population of CIs into the CMDB are two key activities to prepare the CMDB for rollout. The inventory of CIs may be collected via system discovery tools or may reside in multiple sources such as spreadsheets, databases from other applications (i.e. Client Relationships Management system, email, HR system) or directory services (i.e. Active Directory, UNIX NIS). It is essential that the Configuration Management tool has the capability to import data through one of the following means:

- interface with adaptors/translators for vendor specific systems discovery tools
- accept character delimiter file or MS EXCEL file and convert the data via end-user definable mapping tables
- application Programming Interfaces (APIs) to map dissimilar data structures between two different databases
- interface with third party data mapping products

Ongoing operations

Once the data is populated into the CMDB, the effective use and management of the data to support all other IT Service Management processes depends on the update and reporting capabilities of the Configuration Management tool. Look for the following key functionalities when selecting a Configuration Management tool:

- access and update permission of CMDB definable by role based security, group based security and individual permissions
- creation/update/deletion of CIs and related information is auditable
- close integration with Incident, Problem, Change and Release Management tools
- capability to define CI relationships (i.e. peer to peer, parent-child) with no restrictions on number of levels in the hierarchy
- capability to customize end-user definable CI relationship types and attributes
- capability to define new versions of 'to-be' CIs and their relationships that exist in production while still preserving their current product definitions. A snapshot of a group of existing CIs and their relationships can be taken to and a new version of this grouping created with alterations to certain attributes and/or relationships. This provides the capability to conduct 'what-if' scenarios analysis or prepare for a new change request with the ability to fall back to previous CI definitions
- graphical representation of CIs and their relationships showing multiple tiers and allowing interactive selection of CI icon for drill down of detailed attribute information
- allow searching of CI by attributes.

Reporting

The reports from the Configuration Management tool are unlikely to meet all reporting requirements. Even if the tool does provide capabilities to create customized reports, these functions may not be adequate to produce advanced reports. The Configuration Management tool should have the capability to interface with other more advanced third party reporting tools through the use of ODBC drivers or generic SQL programming language. It is also desirable to have a Configuration Management tool built with a third party relational Database Management System (DBMS) with the entity relationship diagram of the CMDB documented as part of the technical documentation supplied with the tool.

Annex A3.1 Sample CI Classes and CI Types

A3.1.1 Physical CI

The table below lists examples of different physical CI Classes and associated CI Types. Depending on the scope and depth of Configuration Management within the organization the list may be expanded or reduced.

CI Class	CI Type
Computer	Mainframe Midrange Server Desktop Laptop PDA
Computing Device	Monitor Printer Modem Tape Drive Disk Array
Software	Application Operating System System Management Database Management System Middleware Database
Network	Data Circuit Voice Circuit
Network Device	Multi-slot Router Stack Router Brouter Switch
Appliance	Firewall SAN Disk Storage NAS Disk Storage
Facility	HVAC (Heating, Ventilation, Air Conditioning) Cabinet Electrical Power Unit Cable Tray UPS
Document	Process/Procedure Policy Technical Contract

A3.1.2 Logical CI

The table below lists examples of different logical CI Classes and associated CI Types. Depending on the complexity of the Configuration Management structure defined by your organization, the list may be expanded or reduced. The logical CIs fulfill two purposes: grouping for Services and Systems and grouping for virtual representation of physical CIs.

The table below lists the logical CI Classes and CI Types for the purpose of grouping Services and Systems.

CI Class	CI Type
Services	Technical System Professional Service
System	Business Infrastructure
Technology	Computer Computing Device Software Network Network Device Appliance
Other	Document Facility

The table below lists the logical CI Class and CI Types for the purpose of grouping virtual representation of physical CIs.

CI Class	CI Type
Cluster	Mainframe Server Storage Database Logical Partition

Annex A3.2 Configuration Structure Model

The basic configuration structure used to model services and their related systems and components is shown below. This four tier hierarchy model consists of logical CIs in the top three tiers while the physical CIs are represented in the fourth tier.

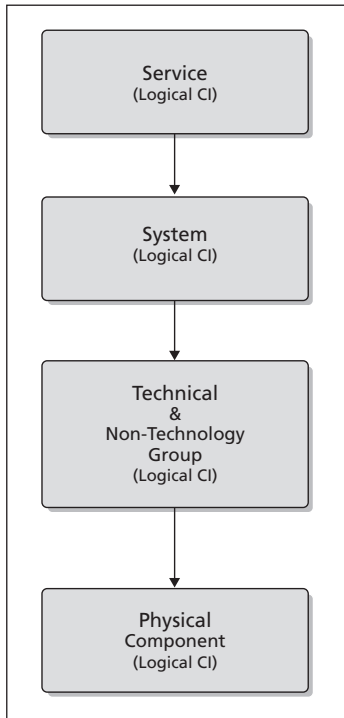


Figure 3.4 Configuration Structure Model

A3.2.1 Example Configuration Structure

The diagram below illustrates the use of logical and physical CI Classes and CI Types, as defined in Annex A3.1, to model the configuration structure for an email service. To simplify the illustration, not all the CIs for the email service are included in the diagram. This example shows the email service comprising of two different systems, Lotus Notes and MS Exchange. The MS Exchange system is modelled in more detail to include servers (e.g. msxapp01, msxapp02, msxdsb01), software (e.g. MS Exchange, the Exchange database msxdsb01) and related documents and software licenses.

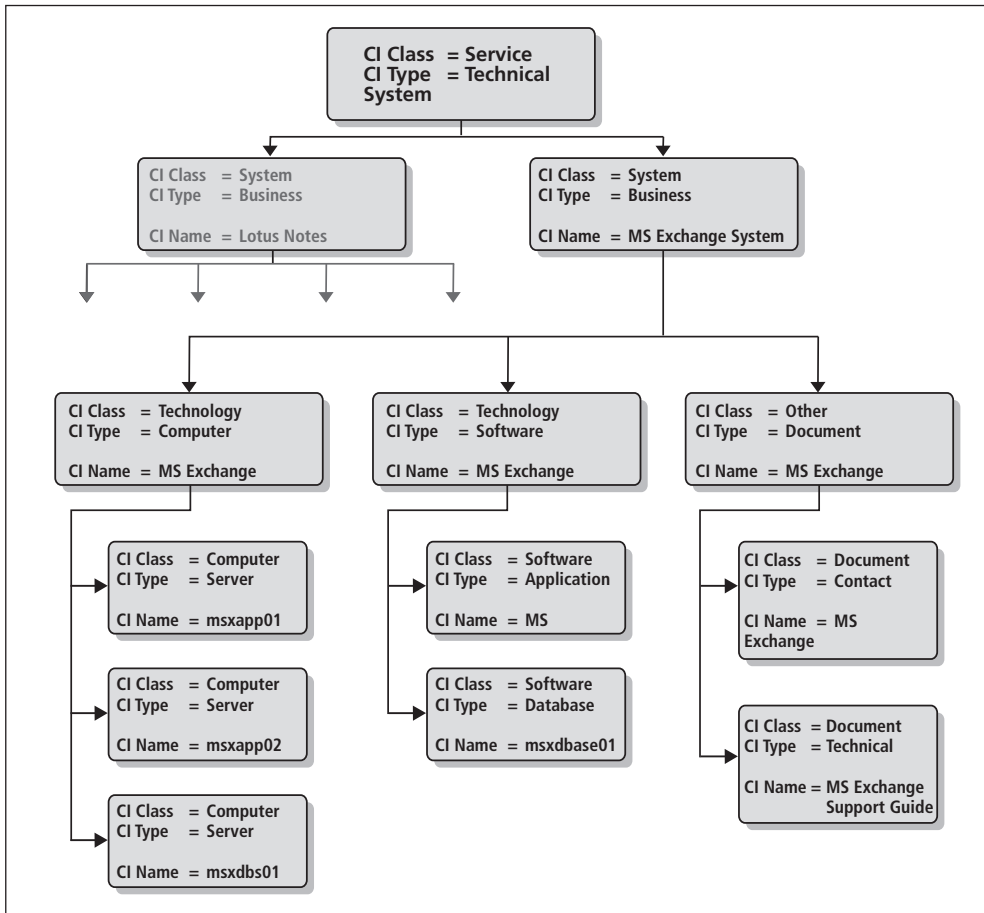


Figure 3.5 Example Configuration Structure

Annex A3.3 'As Is' Process Discovery Template

For each support group that manages acquisition, move/change and disposal of CIs, provide the following template to help them to gather the data necessary to assess the processes for managing their CIs.

Support Group Name : _____

I. Acquisition Process

1. Is this process documented?
 - Yes, provide the softcopy/hardcopy.
 - No
2. Is this process formalized within your group?
 - Yes, proceed to answer question 3, 4, 5, 6, 7
 - No, proceed to answer next process
3. Who is the owner of this process?
4. What percentage of the time does your group follow the formalized process?
 - Greater than 90% of the time
 - Between 90% to 70%
 - Between 70% to 50%
 - Less than 50%
5. Does this process update the CMDB?
 - No
 - Yes, Attributes only
 - Yes, Attributes and Relationships
6. List the CI Types governed by this process:
7. List the CI Types not governed by this process:

II. Move/Change Process

1. Is this process documented?
 - Yes, provide the softcopy/hardcopy.
 - No
2. Is this process formalized within your group?
 - Yes, proceed to answer question 3, 4, 5, 6
 - No, proceed to answer next process
3. Who is the owner of this process?
4. What percentage of the time does your group follow the formalized process?
 - Greater than 90% of the time
 - Between 90% to 70%
 - Between 70% to 50%
 - Less than 50%
5. Does this process update the CMDB?
 - No
 - Yes, Attributes only
 - Yes, Attributes and Relationships
6. List the CI Types governed by this process:
7. List the CI Types not governed by this process:

III. Disposal Process

1. Is this process documented?
 - Yes, provide the softcopy/hardcopy.
 - No
2. Is this process formalized within your group?
 - Yes, proceed to answer question 3, 4, 5, 6, 7
 - No
3. Who is the owner of this process?
4. What percentage of the time does your group follow the formalized process?
 - Greater than 90% of the time
 - Between 90% to 70%
 - Between 70% to 50%
 - Less than 50%
5. Does this process update the CMDB?
 - No
 - Yes, Attributes only
 - Yes, Attributes and Relationships
6. List the CI Types governed by this process:
7. List the CI Types not governed by this process:

Annex A3.4 'As Is' CI Inventory Assessment Template

Complete the template below for each CI Class and its associated CI Types. Refer to Annex A3.1 for lists of CI Class and CI Type.

CI Class : _____	CI Type: a	CI Type: b	CI Type: c	CI Type: d	CI Type: e	CI Type: f
Approximately how many CIs are in production?						
List the location where the CIs are installed. (location a) (location b) (location c) (location d) (location e) All of the above						
Is this CI type governed by a formalized move/add/change/dispose process? (Y/N)						
Is this CI type recorded in a repository (i.e. database, spreadsheet, etc)? (Y/N) If the answer is "Y", please complete questions 5 & 6						
Provide the name and location of the repository.						
In terms of percentage, how accurate is the inventory in the repository compare to the production environment? greater than 90% between 90% to 70% between 70% to 50% less than 50%						
Is an automated discovery tool used to collect the inventory data? (Y/N)						

Annex A3.5 Sample CI Relationships Diagram

A Quick Reference Guide should be developed to illustrate various combinations of CI to CI relationships. This will help Support staff to quickly determine and understand the relationships that a CI may have with other CIs. For each CI type, define all possible relationships it can have with other CI types. The example below shows all possible relationships a server CI (located in the circle) can have with other CI types, including another redundant server for contingency purposes. Notice the association is not only limited to physical CIs; relationship to logical CIs (e.g. System xyz) is also shown.

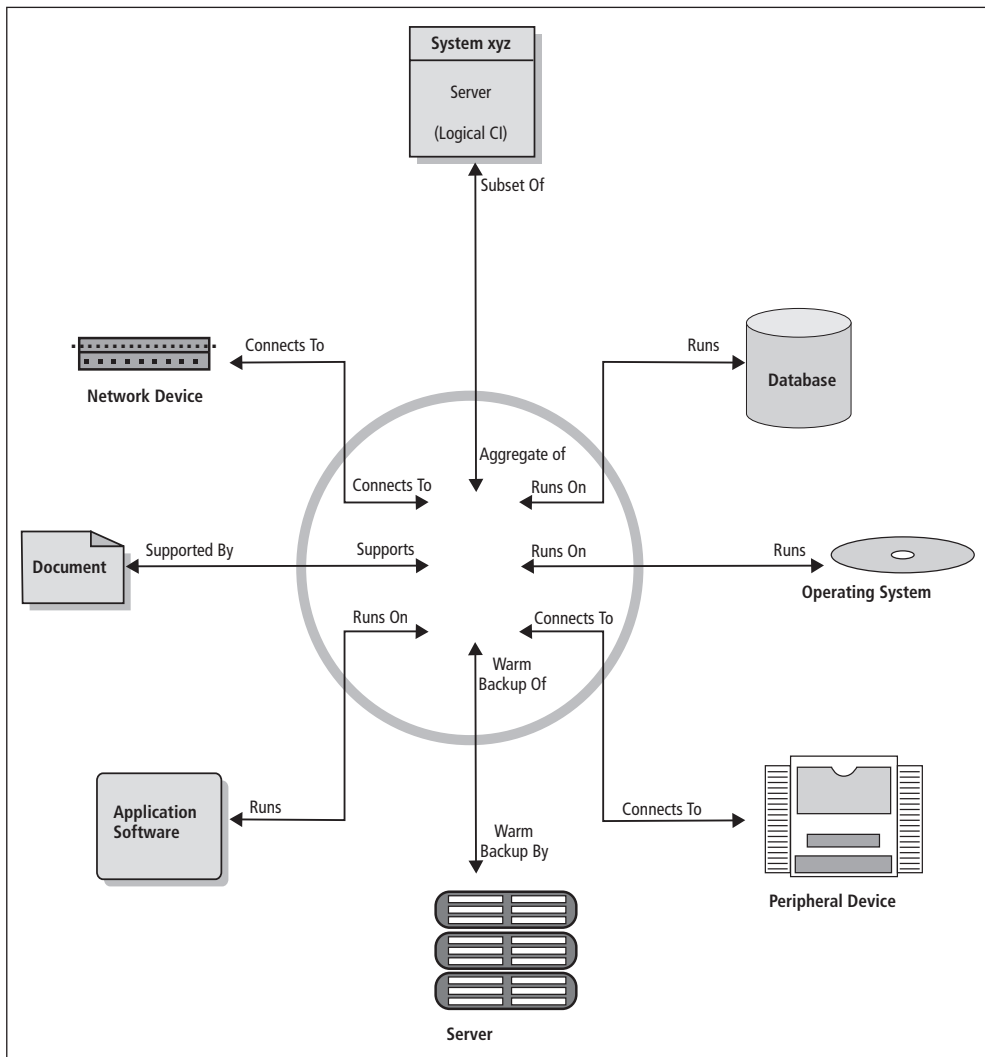


Figure 3.6 Sample CI Relationship Diagram

Annex A3.6 ARCI Matrix Template

To use the ARCI Matrix template, list all the process activities (as shown in the High Level Process flow diagram) in the first column of the Matrix. Then list all possible functional groups (e.g. Service Desk, Desktop Support, Server Support, Network Support, etc) that may be involved with the process activities. For each process activity, place one or more of the following letters in the column of the functional group if the group is engaged with the process :

- A - Accountable for the process
 - R - Responsible to execute the process activity
 - C - Consulted for more information before the process activity is executed
 - I - Informed, either before or after the process activity is executed
- (Note: 'A' only appears under the Process Owner column because the Process Owner has full accountability for the process.)

Process Activity	Process Owner	Functional Group : a	Functional Group : b	Functional Group : c	Functional Group : d	Functional Group : e
Process Activity 1	A					
Process Activity 2	A					
Process Activity 3	A					
Process Activity 4	A					
Process Activity 5	A					
Process Activity 6	A					
Process Activity 7	A					
Process Activity 8	A					
Process Activity 9	A					
Process Activity 10	A					
Process Activity 11	A					

A3.6.1 Example ARCI Matrix

#	Actions	Configuration Manager	Configuration Coordinator	Tool Administrator	Production Support Group Managers	PS Groups / Client FLS	Service Desk	Change Management Group	Senior Management
A	Procurement (Acquisition)								
B	SC&D Management								
C	Incident Management								
D	Problem Management								
E	Capacity Management								
F	Service Continuity Management								
1	Does template exist?	A				R	R		
2	Notify Configuration Coordinator	A	(I)			R	R		
3	Define CI/CI component/attribute structure and business model relationships	A/R	R	R/C	R/C	R/C			
4	Authorization by Configuration Manager	A/R	R	I	I	I			
5	Change Management	C	R/C	R/C				A/R	
6	Notify Configuration Coordinator	A	(I)	R					
7	Register new CI record (inventory, license information (CI status: Received)	A			R/I	I	I		
8	Determine product categorization and attributes	A			R/I	I	I		
9	Storage required?	A			C				
10	Storage (CI Status: In inventory)	A			I	I	I		
11	High or low risk change?	A			R/C			C	
12	Process RFC				R/C			A/R	
13	Determine technical peer and service relationships	A	R		R			I	
14	Assess impact	C	R		R/C	C	C	A/R	
15	Determine technical peer and service relationships	A	R		R			I	
16	Approve change				R/(I)	(I)	(I)	A/R	
17	Coordinate, install/implement				R/(I)			A/R	
18	Notify Configuration Coordinator		(I)		R/I	I	I	A/R	
19	Verify/update all attributes and associations for new/existing CI record	A/R	R		R/C/I	R/I	R/I	R/I	
20	High or low risk change?	A			R/C			C	
21	Produce CI modification report; add to CI status report	A			R/(I)	(I)	(I)	(I)	(I)
21	Configuration Management meeting; validate record modification	A/R	R	C	R	I	I	R/I	
23	Post change review	R		I	R			A/R	I